

TOWN OF NEWINGTON  
CONSERVATION COMMISSION

January 8, 2012  
Special Meeting

**I. CALL TO ORDER**

Chairman Block: As it is now 7:00, I'm calling this special meeting of the Newington Conservation Commission to order.

**II. ROLL CALL**

In attendance:

Philip Block, Chairman  
John Igielski, Secretary  
Dr. Kathleen Clark, Member  
Adreas Sadik, Member  
Alan Paskewich-Alternate-seated for Jeffrey Zelek

Absent:

Jeffrey Zelek-Vice-Chairman  
Philip Shapiro, Member

Chairman Block: Our secretary Peter Arbur is here and our Town Engineer, Chris Greenlaw will be back in a second. First matter is acceptance of the minutes of our meeting of December 4<sup>th</sup>. Are there any questions and comments besides the fact that I am in awe over the detail that our secretary has created. Anybody?

Commissioner Igielski: There are a few places where the Chair is referred to as Mr. Pruett instead of yourself, Mr. Block. On page 2, at the top of the page, the comment that I had made, where it ends with the vote was unanimously in favor of the motion, I believe that should be seven, not six voting YES. There were seven Commissioners present. That's all I have.

Chairman Block: Anybody else? There's one or two, on page 17 in the middle, the comment by Ray Gradwell, something about chick trees, which I presume should be something else, though I don't know what, and on page 18, in the middle, a comment by me, mass rock is generally re-contouring and it should be recontouring, one word. And I think that was all I found. Anybody else?

Commissioner Sadik moved to accept the minutes as corrected. The motion was seconded by Commissioner Paskewich. The vote was unanimously in favor of the motion, with five voting YES.

Commissioner Block: And with that we will convene this meeting. Public Hearing-Continuation of application, 2012-12 the Russell Road north of Old Highway. Is the applicant ready to proceed?

Chris Greenlaw: Mr. Chair, I have if you will the Public Hearing Notice. We have a notice of hearing that was published in the Hartford Courant and the insertion dates were 12/26/2012 and January 2, 2013. It's a Notice of Public Hearing Town of Newington Conservation Commission Town Hall Conference Room L101 Lower Level Tuesday January 8, 2013 7:00

p.m. The Newington Conservation Commission will hold a public hearing to consider the following: Application 2012-22 for a proposed 48 lot open space residential subdivision development on Russell Road, north of Old Highway, Newington by Toll Brothers Inc., 53 Church Hill Road, Newtown, CT 06470. All materials and plans relevant to the above application are on file at the town engineering office in the foyer. Dated at Newington December 10, 2012 Phil Block Chairman, Newington Conservation Commission.

Chairman Block: Thank you.

Tom Regan: Thank you Mr. Chairman, for the record my name is Tom Regan, I'm an attorney with the law firm of Brown Rudnick, LLT, City Place One, Hartford here representing the applicant tonight, Toll Brothers. Since our last hearing our consultants have been working quite diligently with the town's consultants to provide an array of information and answer an array of questions and respond to an array of questions and new information up to and including the DEEP letter which we received at 7:03 this morning. So in response to that our team has several presentations, many of which were summarized in material that was presented and some of which is new in response to the DEEP letter which again, as I said, we received at 7:03 this morning, so we've had twelve hours to respond, plus or minus. But, with that I'm going to turn the presentation over to Ray Gradwell who is going to start our presentation.

Ray Gradwell: For the record, my name is Ray Gradwell, 355 Research Parkway with BL Companies. I'm the senior project manager and a special engineer in the State of Connecticut. I'd like to briefly summarize the application and the plans as they got distributed to the town as recently as today.

As Attorney Regan mentioned, we received a letter from DEEP this morning at approximately 7:03 and had a couple questions and comments on that letter. My staff and Mr. Rossi and a team worked diligently this afternoon and this morning to shift some lots around and respond to that DEEP letter. I'll describe what you see here is a response to that DEEP letter. The wetlands on site are located here, here and here. The fifty foot buffer here and here, and the 100 foot buffer here. Fifty foot, one hundred foot. DEEP had mentioned in their letter 150 foot buffer. We added the 150 foot buffer all around that central wetland because this western wetland doesn't really impact. They were more concerned with the central wetland with respect to the features in that wetland. We plotted the 150 foot line and we looked at the information in that letter with respect to, they referred to topography, steep slopes in that 150 foot upland review buffer. So we removed the lots that are within that steep area, approximately four of them, right here, and re-shifted, reconfigured the subdivision to make it a forty-eight lot subdivision but eliminate those lots that DEEP seemed to be concerned with in that letter they wrote and that we got this morning. That was the one scramble around this morning and this afternoon to look at. Additionally we got the ERT report the end of December I believe and we had the opportunity to read that report and respond to that report also and we responded to that report the end of December, just after Christmas with revised plans. I'll summarize the revisions to those plans very briefly. ERT, Environmental Review Team, was looking for some low impact design items to be placed on the site. We added those recommendations. They were looking for some rain gardens so we created some rain gardens at the end of the cul-de-sacs per their recommendations. Additionally, as far as the ERT review we had temporary sediment traps on the site, and I'll run through that plan as we get a little bit further along in the presentation, they asked us to calculate the wet volume. We provided that information for the record. I'm just going to go through this letter and hit the high-lights with ERT. The one thing that ERT had comments on that we will present a little bit further along, is the construction phasing. They asked the applicant, us, to look at construction phasing, to limit the areas' disturbance a little bit further. Take smaller bites of the apple, per se and develop this project with smaller manners.

So the applicants, myself and Dan, worked together to do that. We've created a three phase plan, Phase One, Phase Two, Phase Three, and we are going to work those phases in a manner to create permanent measures around those phases, clear the land within those phases, establish temporary sediment measures within those phases, do the cuts and fills within those phases, and then stabilize within that phase, and then move to the next phase. It's kind of a DEEP guideline, we're taking that comment from ERT a little bit further and phasing it a little bit further along so we took that comment from ERT, looked at DEEP's manual and revised the plans accordingly per ERT. ERT, and I believe some of the Commission's comments had some concerns and comments regarding the amphibian tunnel length. The amphibian tunnel was located here and was approximately 190 feet long. The plans that you received today, Dan and myself, the applicant's team worked together to shorten that length to 90 feet, right here, so it's about 100 feet that we shortened it per some of the questions and comments within the ERT report. I'll flip through a little further.

Chairman Block: Before you do that, what is the parameters for the timing for you know, the different phases?

Ray Gradwell: Timing, as in how long it's going to take?

Chairman Block: Going onto the next phase.

Ray Gradwell: The stabilization of the soils. As you work this phase, create your cuts, to create your fills, and you stabilize the soil with whatever means you stabilize it with, whether it's an erosion control blanket and seed and the seed established, there's a definition for stabilization of soil in the plans, so if you review the plans, I believe it's on the erosion control notes. There's a definition of what stabilize means, there is a definition for it and we want to make sure, before we move to Phase Two that the site soils are stabilized.

Chairman Block: How are you going to integrate Phase One down at this end with the test blasting, and the blasting process itself?

Ray Gradwell: Okay, let me flip to, a little further along, good question Mr. Chair. This is a little colored diagram of where our cuts and fills are and our phase outlines. Phase One, Phase Two, Phase Three, so our Phase One here, we approach this phase, construction entrance, clear our site and do our test blast in the lower area of the site, the farthest away from the wetland as possible, though we would do our test blast in the southeast corner, do excavation, create this pond. The excavation depths are noted on here with respect to foundations and utilities. We have a ten foot excavation for foundations and a eight foot excavation at the detention pond.

Commissioner Sidak: What is the significance between the red and the blue, is that just distance and depth?

Ray Gradwell: That's a good question. The red is cut, the cut material below grade, the blue is fill, you place material on grade. So the depth of excavations are shown here and the triangles and squares. The squares are identified for foundations, depths, excavations, and the triangles are noted for excavations for utilities within the road.

Commissioner Sidak: You mentioned earlier about rain gardens, one of the first things you mentioned. Is that just a catch basin? What exactly is that? Is that a natural....

Ray Gradwell: This shows it a little bit better. This is a plan that has been revised since. The rain garden, as you mentioned, at the end of the cul-de-sac, the cul-de-sac is one big

expanse of pavement. What we are doing to minimize the impervious surface, the hard surface at the end of the cul-de-sac is to create a planting area, a little depression that collects storm water, that allows storm water to infiltrate back into the ground. Rain Garden. There are a bunch of different ways to do a rain garden, but that is the way that we are proposing it.

Chairman Block: Is there any indication on any of these as to the depth of the soil that is going to be in these rain gardens and what do they drain in to.

Ray Gradwell: There is, on the project details, there is a section for what we are proposing in that rain garden. It's a top soil matter, a stone layer because we want the water to flow through, and then there is plant material on top of that, the plant material for a rain garden likes wet feet, but likes dry feet too, you want those, you want a mix of plant materials along the top of the rain garden and that will drain into the soil below. You want it to drain into the soil below.

Chairman Block: With the cuts and all, is there going to be any soil below?

Ray Gradwell: Yeah, because the rain gardens, see this is placed in a fill, that is placed in a light fill, that's placed in a light fill, and that is placed in a shallow cut so there will be soils below the rain garden for water to infiltrate into.

Commissioner Clark: Mr. Gradwell, what kind of maintenance does a rain garden require and would that be undertaken by the homeowners association in perpetuity?

Ray Gradwell: In perpetuity, yes. The rain gardens do take periodic maintenance, you can't plant them and forget about them, the maintenance that is required is specified on the plans. HOA will be responsible for that maintenance of the rain gardens. We added per ERT's comments, they wanted us to be a little more specific in regards to maintenance and who maintains what, who looks for invasives, and when they find invasive species so the revised plans and response to ERT's comments note that when to look for invasives, what to do with invasives, when to inspect the detention pond, and what to do when you do it, and what time you do it, the frequency. You just can't do it once a year and forget about it. Some things are a little bit more hand holding per se, and that is noted on the plans in response to the ERT comments. They were looking for a little more detail on maintenance, HOA versus Town.

Commissioner Paskevich: When you speak to cuts is that all blasting, or is cut blasting, and digging for excavation? Can they be one and the same?

Ray Gradwell: No, when I speak to cuts there are two types of cuts. There is earth excavation and then there is rock excavation. I'm speaking to cut here as overall excavation, rock and soil, so this is a cut area in pink, this is a fill area in blue. The cut areas can include rock or soil. It's likely going to be a mix in this area because you have ten foot area, and there are shallow soils on top of existing rock.

Commissioner Paskevich: So what I don't know and I have been questioning in my own mind through this process is, how much of the area is actually going to be blasted?

Ray Gradwell: Well, the area that will be blasted along the utility trenches, we have a thirty foot deep utility trench here, that is the high point of the land, roughly here and here, we have a thirty foot utility trench, obviously that is going to be blasted, twenty foot deep, it's in a cut already, that will be blasted. The detention pond, shallow soils, we have a eight foot cut in that area, likely to be blasted. This basement, once again, shallow soils, likely to be rock

excavation and blasting techniques. Most of the areas where in excessive, the soils that were identified in the test pits, we did fourteen test pits to identify the depth of soil that we have on site, the depth of top soil we have on site, and where rock was generally on the site so we can estimate that and determine where we can anticipate cut, rock, cut, soil or fill that we can use on site.

Commissioner Clark: When you conduct any test blast, say test blast number one in the eastern most corner there, what parameters are you looking for? When you tested, what are you testing for?

Ray Gradwell: I'll let the blasting expert answer that question. He's going to come up in a little bit, after I wrap up my presentation and talk a little bit more about what the team has done in the last few weeks, working with Mr. Hosley and his team to more specify the blasting plan, the test blast plan, so I'll let Mr. Simms come up and talk and answer that question directly, if you don't mind.

Commissioner Sadik: A question in regards to the fill. There are quite a few fill areas, are you going to truck in soil or are you just going to use from the red to the blue?

Ray Gradwell: We are going to use the red to the blue. Red to the Blue, so it's going to be a cut, excavate, fill, cut, excavate, fill, cut, excavate, cut, fill, cut fill, so we are going to try to use the soils that are on site to create the fills. The cuts to create the fills.

Chairman Block: At one of the prior hearings, had a comments that I believe that you determined the amount of soil cut availability on the basis of eleven sample points.

Ray Gradwell: Fourteen.

Chairman Block: Oh, it's fourteen. Any statistical analysis as to how accurate that is likely to turn out as against you being short of soils?

Ray Gradwell: I think fourteen is a good representation of what we have on site knowing the site, knowing the geology of the site. Mr. Slayback can talk about the geology a little bit further but I think fourteen is a good representation. I've worked on projects where we haven't done any. Just the engineer and the geologist and the soil scientist know the land pretty well, they don't need to do borings, and that is the risk that they take. We chose to do fourteen test pits to identify top soil, stratum, substratum, and then where rock is so that we can feel confident that the areas that we are showing in pink here are cut rock or cut fill. Did I get to your answer?

Chairman Block: You did, but I'm going to push it a little bit further if you don't mind. We have previously seen the watershed map for what actually feeds into the wetlands area and it's pretty much half of Phase Three. You have the triangles for the depth of cuts but not in Phase Three.

Ray Gradwell: Oh, I do. Here, I have them, I have them for each phase, so I have the phase, as you go up on Phase 3, the six foot cut for this utility, an eight foot cut for that foundation, a twenty foot cut for that utility.....

Chairman Block: Well that illustrates my concern, the twenty foot and the ten foot cuts, thirty-eight and the one in the, I believe are in the watershed that is directly responsible for the maintenance of the wetlands.

Ray Gradwell: This?

Chairman Block: Yes, and the other one over there, right there. At those depths, are you intercepting a fair amount of water from the upper lots, is that water going to get diverted back into the wetlands?

Ray Gradwell: That's a good question.

Chairman Block: Or is it going to be lost?

Ray Gradwell: What we are doing here is, along the pipe trenches, along the utilities we're replacing in the rock excavation, twenty foot going to be in rock, we have a sewer main that is going to be in the rock excavation, so within that rock excavation we are going to place an impervious dam per se, detailed here, it will be a six inch wide impervious material such as a silt or clay, placed in the trench that will keep the water from running along the pipe, the stone in the trench and keep it from running away from the wetlands. It will allow the pound pump into the native soils and once it is in the native soils it can flow back.....

Chairman Block: But when you are talking about, for example an eighteen foot cut how much of that trench is going to be filled with the impervious material?

Ray Gradwell: All the way up to the top of, from the bottom of the excavation all the way up to the top of the rock, wherever that interface is. So, we've added some more bells and whistles. With respect to storm drainage, I believe it is ERT who asked us to look at our anticipated treatment train efficiency on the site. The project is going to be held to a Connecticut DEEP general permit for storm water construction activities. In that permit they require you to meet eighty percent total (inaudible) removal. Post construction we anticipate this project, with the BMP's we are proposing, pavement sweeping, deep sump catch basins, hooded catch basins, the storm water treatment unit, at the end of the line, as well as the storm water pond we are proposing, we anticipate that the overall efficiency on the project to be in excess of ninety percent. So well in excess of the eighty percent required by DEEP. Almost as high as you can possibly get. The storm water pond is a great tool for removing total suspended solids, and Ron will elaborate a little further on that as he gets into his presentation.

Another comment and question from ERT, I just want to hit upon this before I kind of wrap up, the location of this drainage outfall. The topography that we are proposing to the outlet was in excess of ERT's recommendation of five percent so we were able to move that, our old outfall location was here, I can show it to you on the colored version because I left it there, so I can describe a little further, we moved that outfall location from here, to here. It's a flatter area of the site, it's less than the five percent that was in ERT's recommendation to accommodate that comment that ERT had posed to the applicant's team. So there were a lot of things that we were able to account for in the ERT report and in the short time that we had.

Commissioner Sadik: So, what is the significance of that area again?

Ray Gradwell: It's flatter, I'm sorry I cut you off, it's a flatter area, it will allow the water to kind of flow naturally over the land versus more, this area was, you can see the contours here, these are contours, five, five, five, much steeper than the area that we are proposing here, nice and flat, there is only one contour in that area, so it is a nice flat area that will allow water more naturally to disperse over the terrain.

Chairman Block: What is the percentage that will seep into the wetlands from that location?

Ray Gradwell: That location is on the saddle of the land, you can see the contour wrap around out there, so a portion of that water will run this way off the saddle.....

Chairman Block: Approximately half.

Ray Gradwell: About half, we kind of split it right in the middle and a portion of it will run that way to that well, so we wanted to, we didn't want to short this well and with the location of this outfall we wanted to give some back there and give some back there. It was a nice place to actually put that outfall. Just some other high lights of the ERT report. I'll just go over briefly and then I will ask Doug to come up and talk a little further about blasting and answer your blasting questions. We got the amphibian crossing, on this plan, ERT had asked us to look at, in the area where we have the sediment-four bay to create a berm in that area that water will pass through, and be filtered, so this gray area here and this gray area here are berms in the sediment four bay that allow water to come out this outfall, be filtered through this berm, before it has the opportunity to run through the (inaudible) control structure, through this level spreader and to that central wetland. So it's another filtering device placed in this sediment fourbay and that sediment fourbay to protect the downstream resource that the Commission is looking for us to protect. Here is just a summary of how hard the applicants worked over the last few weeks, we revised and met with MDC, revised the sewer plans, and in the process of revising detention basin number two for Wethersfield and 61 Arrow's comments, revised the clearing line for the Town of Wethersfield's comments and questions, added some rain gardens, revised the construction phasing, identified wet and dry storage for each temporary sediment trap on the site, added more maintenance provisions, with respect to storm water measures, plantings, invasive species and those removal of invasives. We added some additional E & S notes per ERT's comments, we added the stone berm and moved the level spreader, identified roof drain locations and added some more detail, signage, with respect to the amphibian crossing. On each side of the road we're going to identify that there is an amphibian crossing in that location, and as species are identified they can be placed on the plaque, and we also shortened, and lastly we shortened the amphibian crossing per ERT's and the comments from the Commission with respect to that amphibian tunnel. I'd like to ask Doug.....

Commissioner Igelski: Would you go back to I think pretty much your first slide where you showed that four lots were removed?

Ray Gradwell: The four lots were shifted.

Commissioner Igelski: Were shifted?

Ray Gradwell: We moved those four lots into that area of the site.

Commissioner Paskevich: Is that 27 to 30?

Ray Gradwell: 27,28, 29 and 30. I believe we kept 27 and moved 28, 29 and 30.

Commissioner Paskevich: What's the fourth lot?

Ray Gradwell: We shifted the size of this fourth lot.

Commissioner Paskevich: The size of it.

Ray Gradwell: The three lots that were in here and the fourth lot we shifted the size, the three lots we moved up to Traprock Way and Trailside Drive.

Commissioner Paskevich: So you downsized the size of the lots.

Ray Gradwell: Correct, we tightened up those, the dimensions were I believe 100 feet wide, we made them 80 feet wide in this area, and they still meet the zoning requirements, 80 feet minimum.

Commissioner Igelski: In subsequent screens or slides those lots, 28, 29, and 30 were still shown.

Ray Gradwell: Correct, we have not had the opportunity, we just got that comment this morning at 7:03 and we haven't had the opportunity to go through. We revised the grading plan to make sure we could make it work, but we haven't had the opportunity to revise all of the plans and resubmit it back to the Town. We wanted to get a little feedback from the Commission on that.

Commissioner Clark: So you chose those lots over some of the adjacent lots, but did the newly suggested 150 foot buffer actually go into some existing lots?

Ray Gradwell: That's a good question, it does, the 150 foot buffer is this blue line, so the lots that are within the blue line, the top there, the corner of that lot, the corner of that lot, and a small corner of that lot I guess, there were four lots, we chose that area because that was the area, if you read the ERT, not the ERT letter, the DEEP letter, they were concerned with the steep topography. This was the area of the site with the steepest topography that drained to the west to that central wetland.

Commissioner Clark: That one looks like, doesn't it go right up to the house, so it's not just a little corner, it seems to go right up to the house.

Ray Gradwell: That does go right up to the house, correct.

Attorney Regan: But in those areas, just be clear, in those areas, the topography is not steep, it was not the concern, what was the concern is the DEEP Letter concerned about the steep topography getting the extra fifty feet and we added the extra fifty feet that DEEP suggested over this Commission's requirements in those areas where the topography was steep.

Ray Gradwell: If you have a chance, take a look at that letter. Chris, can you get that letter to the Commission? It is a pretty good letter, and we tried to respect that and that is why we scrambled around this morning, reading this letter and saying what can we do, what can we do, what can we do. We can deal with it, and it's not the end of the world, We can take that letter to heart, get rid of lots in the steep topography, reshift some lots on Traprock and Trailside, and still account for 48 lots, but respect that letter, respect that comment from DEEP.

Chris Greenlaw: Mr. Gradwell, if I may, this letter that we are talking about is an addendum from the report received from Mr. Debaris, Biologist and Ecologist. As an addendum to the report he sent this, he drafted this letter yesterday. This was received last night, e-mail, and so first thing this morning I shot it off to all parties, knowing the importance of this so that you would have the opportunity as you did so well, so I'd like to mention that this be entered into the record today with the changes, the date is January 7<sup>th</sup>, 2013 from Mr. Debaris, he's a Botanist and an Ecologist.

Ray Gradwell: One last thing before I ask Doug to come up, that is, comments from the public and a Commission member had asked the applicant to look into whether this is an Army Corps jurisdiction or not. We had the opportunity to submit plans to the Army Corps and they came back and said an Army Corp permit is not required, this letter was sent to the town, it was sent to me also, so I'd like to enter that into the record.

Chairman Block; Just to clarify, what is the date of that letter?

Chris Greenlaw: December 10, 2012.

Ray Gradwell: Doug, would you like to spend a minute with the Commission?

Chairman Block: For the record, the letter is from the Department of the Army, District Corps of Engineers, File 2-122336 to Dan Rossi, Assistant (inaudible) Toll Brothers. Dear Mr. Rossi, we have received the plans presenting the housing subdivision you propose to build on Cedar Mountain at Russell Road in Newington, Connecticut. Based on the information you provided we have determined that a Department of the Army permit is not required for the work as described in your submittal. The rest is referenced to their authority and it ends, such no work in or affecting navigatable waters will occur and no fill or excavation will impact or take place in waters or wetlands, the Department of the Army permit is not required. Robert J. DeSista, Chief Permits.

Attorney Regan: Mr. Chairman, can I just clarify one part of the corps permit that you just read as well? There's been a lot of discussion trying to suggest that there are intermittent watercourses here and that these connect to navigatable waterways, but I want to be clear that that is only one of the two criteria for corps jurisdiction and Mr. Logan correctly pointed out after the last hearing, you also have to be filling in a wetland or watercourse, and we are going neither here, so even if these did connect to a navigatable waterway, there is no filling going on in a wetland or a watercourse so that the Corps jurisdiction wouldn't be triggered even if they were navigatable waters. I just wanted to put that on the record.

Chairman Block: I thank you for putting a period at the end of the sentence. I hope that really does end that issue. Thank you.

Douglas Simms: Commission members, my name is Douglas Simms with DRS Seismic Consultants, out of Oxford Connecticut. We are a consulting firm that provides data to the blasting industry. Early in my career I earned a Connecticut blasting license and maintained it for twenty-five years. But at no time, since establishing DRS have I blasted commercially. I strongly feel that would be a conflict of interest. I have been in the seismic consulting field for over thirty-five years and have witnessed blasts ranging from a few ounces of explosives to twenty tons for the explosives detonated with one delay, many thousands of detonations over the years. I was asked by the applicant to join their team to answer questions from the Commission regarding blasting near wetlands and to respond to the townspeople's questions regarding this project. I was not a part of the Planning and Zoning team for the applicant. I said and maintain that the zone of deprecations from blasting would not exceed, plus or minus ten feet from the closest bore hole given the anticipated cut depths. I base that statement on my direct personal observations gained from years of seismic monitoring. The Commission hired a blasting consultant to help them review materials presented by the applicant. He specifically asked five relevant questions. Question number four asks about a blast plan sequence, and asked if it included a plan for trench rock, mass rock in sensitive areas which included residential, commercial structures and wetlands. Question number five asks about over sight issues. In my response to question number four I suggested utilizing Planning and Zonings approved blasting notes that had been submitted to this Commission,

several addenda, including independent third party seismic monitoring. In addition I suggested a specific site furthest from the wetlands be the initial blasting location. I then proposed specific introductory blast design parameters for mass rock, trench rock, and sensitive area based on the best practices approach. One's I've seen successfully use countless times in actual field conditions. The conservative plan could be modified by the blasting contractor based on these field conditions, blast results and seismic data. The Town's blasting consultant suggested that alternative blast design methods be utilized. The Commission requested that the Town's consultants and the applicant's team get together to work these issues out. We planned for a face to face meeting shortly after the December 4<sup>th</sup> meeting, commission meeting. At the meeting in Meriden which included the Town's engineer, myself, and a Toll Brothers engineer, the town's consultant made specific blast design parameter recommendations allowing the blast contractor greater latitude in blast design. Subsequent blasts could be modified within the results and safety parameters. This mirrored my goals. I then re-wrote the blast design portion incorporating specific suggestions made by the town's consultant. In addition, semantic and other minor errors found in the P & Z blasting sections were corrected and modified by the town's consultant. These were incorporated by the project team into the format that you have today. In every case the applicant has made accommodations with input from the town's blasting consultant a high priority. Ideas suggested by me were also incorporated with regard to the specific wetlands concerns before you. The town's blasting consultant and the project team met as recently as last Thursday to ensure the satisfaction with our submittals. From my recommendations blasting will start in Phase One at a location farthest away from the wetlands, roughly 700 feet from the wetlands setback which Mr. Greenlaw pointed out to me just a moment ago. The project team will flag a specific wetland site, and use that location as a seismic monitor data reference point during blasting to further define blast design as wetlands are approached. Starting farthest away and as we are working towards the wetlands we will have some idea of how the rock is reacting and the vibration that is being transmitted to this wetlands site itself. This is a very conservative, careful approach I've observed for many similar projects. Trench blasting will be the first phase, the significant portion of the cuts will be fifteen feet or less, but there is a small area in the trench that will be up to thirty feet in depth. Mr. Greenlaw pointed at that. I suggested that the applicant insist that the blasting contractor deck any blast hole where the cut depth is over twenty feet. Let me repeat that, I suggest to the applicant that he insist that the blasting contractor deck any blast hole where the depth is over twenty feet.

Chairman Block: Excuse me, please define "deck."

Douglas Simms: I will, I certainly will. That's a good question, I will explain that in just a moment. Let me just finish up. This means that the explosive pounds per delay energy will be roughly reduced in half, an important design consideration while still allowing the product to do its efficient job. I suggested that the overburden remain on site as much as possible during the blasting sequence. This will help to confine the energy and muffle some of the sound of the detonations. The seismic graph instruments are portable and when it is appropriate additional reference sites can be established at other locations as blasting moves on the site. In closing, the site has no blasting issues regarding wetlands because of a significant wetlands setback distance built into the project. Most blasting locations on the site won't exceed fifteen feet, with a significant portion being much shallower. Even at the closest locations to wetlands blasting will not exceed the town's blasting consultant's standoff distance placed on the blast charge column depth. Now I will get to that question in just a moment. To provide oversight for this application, I've suggested two additional firms to the applicant capable of providing the same data as our company does. Thank you for the consideration.

Now, Mr. Block, you asked about a column, decking colume?

Chairman Block: Deck, yes.

Douglas Simms: In cases where you have a significant cut in the rock, I'm going to say twenty feet, the product in the ground has to have enough energy to break the rock, so what we are going to do, or what I have recommended the blasting consultant do is to, the blasting contractor, excuse me, take that twenty foot cut and you load half of the hole with one charge, the detonating and then you put an inert section above it, and then the final ten feet would be at a separate time so that the, even though one hole is being detonated, it's being detonated at two separate times which reduces the pounds per delay being initiated at that time.

Chairman Block: I assume you are talking about millisecond differences?

Douglas Simms: Yes, that is correct. There are numbers of ways that it can be done either non-electrically or electrically.

Chairman Block: Okay, so you are dividing the vertical charges into two pieces.

Douglas Simms: Whenever it gets to be twenty feet, I'm suggesting that they cut it in half. It's a safety factor, it's going to, the job will get done the same way, but it will significantly reduce the pounds per delay.

Chairman Block: Any questions from the Commission? I do have a couple more. In the experience that you are using to evaluate this plan, and forgive me for being so specific, but how much of that is actually been in basalt matrix.

Douglas Simms: All of it. As a matter of fact, yesterday, I worked with a number of quarry companies and that's their job, that's what they do. Yesterday I personally observed two kinds of explosives being detonated.

Chairman Block: And in your experience, as to the rigidity of that material the relationship between the blasting plan that you have been proposing now with our expert as well, do you have any (tape change.)

Douglas Simms: The answer is yes, there will be some seismic waves. They tend to attenuate over the soils, they tend to travel a little bit farther into the rock, we're proposing something that hasn't really been done very often, we don't normally, I can tell you, with 35 years I've never experienced the question about wetlands and vibrations. This is setting up something brand new. We are going to establish some data that might even be in a publication in five years. Let me explain, in terms of the deformation, the actual breaking rock, it's not going to happen. In terms of some of the energy being vibrated to the wetlands, that might happen. Mr. Commissioner, and I'm trying to keep this in terms of wetlands, okay, the, not only are we going to be setting up a seismograph at the wetlands but more importantly the homes by Russell Road where the homeowners are. The criteria for the, that has been established by the Bureau of Mines is much more significant, much more, tighter, much lower than what we are expecting to see over here.

Chairman Block: How many seismic stations are there intended to be for the first test blast.

Douglas Simms: The first test blast we're, FEMA is going to flag the wetlands directly and what I submitted to the applicant to do is to set up a referencing point. I don't want to keep moving, I want to stay in one spot. So that that data, as we are moving, we only want one variable. The only variable is what is happening as the blasting comes closer and closer to

the wetlands. Now, obviously if I was to set up a seismograph in this location, and you are blasting over here, that is not close enough to the wetlands. No, so what I proposed is, as we do different phases to move that reference point. You'll have, the Fire Marshal and the town will have all this data, when we are blasting up here, I want to be over here.

Chairman Block: Well again, is there only going to be one seismic station there.

Douglas Simms: Well, one, we can set up as many as we need to in terms of the seismographs themselves they are very portable and can be moved you know, I wouldn't suggest more than one site because we want to get good data from one location.

Chairman Block: Well, I would, and again, I'm a lay person and I'm only being cautious but I would like to suggest three, one at 29 as you are suggesting, one at somewhere around 32 and one over at perhaps 36.

Douglas Simms: In other words, one here, one here, one here.....

Chairman Block: One directly down stream from in the watershed area.

Douglas Simms: This one here?

Chairman Block: Yeah, in that way, as you do the first blast and then proceed by getting, as you said, the repeated data, as progressing, we would be able to determine the changes around the necessary perimeter of the wetlands.

Douglas Simms: There is no reason not to. We can do that. If you, if the Commission feels that is a condition of the applicant, I have twenty instruments in my inventory.

Chairman Block: I wouldn't go that far.

Douglas Simms: What I wanted to do is make the most practical approach and of course that is why I suggested one over here, but that is a condition of the permit, there's no reason not to use multiple instruments. I do, for some of the quarries that I monitor, the townfolk have me all around the town, I have fifteen instruments set up.

Chairman Block: Any other questions from the Commissioners?

Commissioner Clark: So this instrumentation measuring shock waves...

Douglas Simms: It's measuring vibrations and sound.

Commissioner Clark: But how does that transfer in your opinion, when you say deformation of rocks, based on the kind of rocks that we are dealing with, is that the conclusion that you are coming to based on your experience? And that's what you are able to measure, but not any specific effect on you know, the water....

Douglas Simms: The Commission is concerned about the blasting breaking the basalt under the wetlands and so am I. My answer to that is, the seismic data will help provide some information about how the vibrations are going. In terms of the blast some how affecting the rock 150 feet away, it's not going to happen. I can say that because I have observed it. So what we are trying to do is establish what the vibration levels are, and again, more conservatively, I'm more concerned about Russell Road and the other side of the site than I

am with this particular issue, and I think it's great data to have and as long as the applicant is willing to, if that is a condition of the permit, then we just do that.

Chairman Block: One other question. In the blasting plan as you have modified it, is the criteria the maximum impacts that you would deem acceptable. Are those specified already or how much is the seismic activity or whatever parameters, lets see, there was a term used, PPV or something.....

Douglas Simms: Peak particle velocity.

Chairman Block: Yes, are those criteria listed now in this modified plan?

Douglas Simms: Yes they are. The are in the blasting notes section. Quite a bit of revision, with tremendous help from the town's consultant.

Chairman Block: Okay, thank you again.

Russ Slayback: Once again, I'm Russ Slayback, I'm a consulting hydrogeologist with the firm of Leggett, Brashears and Graham headquartered in Shelton Connecticut. Recently documents provided by George Logan, REMA ecological services, from January 2<sup>nd</sup>, January 3<sup>rd</sup> and January 4<sup>th</sup> pose the hypothesis that wetland number two may be fed by upwelling ground water. I concept that I believe is incorrect, but is also irreverent to the issue of protecting the wetlands for its amphibian population as well as the threatened swamp cottonwood population. My initial hydrogeologic assessment report of August 29, 2012 described the basis for the conclusion shared by Dr. Abrams and myself that this wetland is supported mainly by surface water runoff on its watershed area. In addition to the geologic setting, this data included the elevations of water levels in wetlands one and two. The results of the fourteenth show that wetland one is periodically dry at elevations of 255 to 200 feet from south to north, some forty-five to one hundred feet below the floor of wetland two. The results of fourteen test pits which show no ground water or water seepage which indicates that the water table, the top of the zone of saturation is below the soil profile and lies within the body of the trap rock. Furthermore because wetland two was essentially completely dry last August, as observed by Dr. Abrams and me, as well as later times by Dr. Abrams. Commenting further on wetland one, the so called ravine, it's at a distance of approximately 400 feet from wetland two. That difference in elevation of the water in those two wetlands suggests that the hydraulic gradient, the slope of the water table, between those two locations would have to be on the order of twelve to twenty percent which is an extraordinarily high slope of a water table in a highly fractured rock as described by Dr. Steinam in the original, the first ERT report. When Mr. Logan first posed the concept that this wetland was supported in part with ground water flow, I pointed out the difference between shallow seepage in the soil at the top of the trap rock, also known as subsurface run off, or quick flow and true ground water flow within the zone saturation. The subsurface runoff is slower than overland runoff, but is directly related to precipitation events, but is not ground water flow and does not represent connection to a ground water reservoir. I can comment on the remote possibility that the water table could rise to above the floor of wetland two, in an above normal precipitation season. In relation to the protection of this wetland, I believe this possibility is irreverent because the proposed storm water management plan does everything that can reasonably be done to ensure that the quantity and quality is as close as possible to pre-development condition. By the installation of detention/infiltration basins, the infiltration berms along the edge of the wetland setback boundary, and the use of hooded and sunk catch basins as well as concentrators to cleanse the storm water runoff. In further discussion among the project team, as you heard from Ray Gradwell, the applicant has agreed to install coffer dams also known as water stops, along the utility trenches. The initial design says

they will have, cover fifty feet and what they will do is hold the ground water and prevent the utility trenches from becoming ground water drains. All of these measures are consistent with the 2004 Connecticut Storm Water Manual which is intended to protect the water resources of the state. Further more on the basis of a test boring on December 28<sup>th</sup>, 2012 that Dru Associates was not present for, Mr. Logan appeared to believe that upwelling ground water may occur through a place in wetland two at the site of boring HA-1, but the longer that boring is by no means convincing as the low bearing capacity soil may very well be part of the clay confining unit. If Mr. Logan is correct, if such a place provides a location for ground water upwelling as discussed above it should also then provide a location for downward leakage much as a bathtub drain during dry periods of depressed ground water levels. In ground water hydraulics there are no one way streets where the grading is reversed from up to down. The most simple explanation for the behavior of this wetland is that it dries up in dry seasons because the evapotransformation from this vegetative area exceeds the surface and subsurface runoff when there is insufficient rainfall. Evapotransformation is the sum of the evaporation from water bodies as well as transpiration as part of the growth process of plants and we know that this wetland does support quite a bit of vegetation. On the issue that I was originally retained to address I think the Commission has heard convincing testimony from Doug Simms, Rick Hosley and myself to the effect that a properly conducted blasting program for rock removal in compliance with Connecticut regulations, will not cause damage to the rock more than ten feet from any individual blast hole. The two blasting consultants have strived to reach agreement on acceptable blasting procedures. Furthermore blasting vibrations extending hundreds of feet will not impact or crack the soft subsoils in wetland two. It is my summary viewpoint that discussion at several public hearings may have extended beyond the issues of concern with respect to wetland two. The applicant's project team has identified these issues associated with the protection of wetland two, and has incorporated appropriate design features to mitigate any potential issues. I would put forward the position that the proper practice of civil engineering and hydrogeologic science is to identify the salient issues and provide solutions based on site specific knowledge. It is not an exercise in gathering every possible bit of on site including those data that are not pertinent to problem solving. I'd be happy to answer any questions.

Chairman Block: I have not actually seen the data for that last test hole that you are commenting on, but I was presuming and please correct me if I'm wrong, that he was only saying that there was an area of saturation directly below the water level that was feeding water into the basin. He wasn't talking about any kind of an artesian well situation where it was coming from any depth.

Russ Slayback: I can't go as far as you suggested. He suggested that there was a possible source of ground water upwelling from below. It would be similar to an artesian well, but it would just be some soft gradual upward flow I would think.

Chairman Block: So you are understanding him as saying that it is coming from some depth?

Russ Slayback: From below the floor of the wetland and from below the, what Dr. Abrams and I believe is a confining bed of very impermeable clay. The description of his well log to me, when he describes a, excuse me, I've forgotten his exact words, a low bearing capacity soil, he does not use the word clay. It's clear that there probably is some granular material in it, but I'm not convinced that it isn't part of that overall clay formation, and Dr. Abrams will have some more to say about that.

Chairman Block: I'm sure of that, yes, but in your explanation as the flow, the source, you are also postulating that there's a fractured, a shallow fractured layer of the rock itself that is carrying surface water.

Russ Slayback: No, I think, there may be some water that goes directly down into the bedrock, the trap rock, but I was really describing the flow where the soils are more pervious than the top of the rock, and water rides along the rock in what is called the unsaturated zone, technically the vado zone, but is not true ground water. The water able, as far as we know is down into the rock.

Chairman Block: And again, I'm just trying to see if there is a common ground, if that layer is covered by some less permeable layer and you punctures that, then there would be a shallow upswell, would there not?

Russ Slayback: If you believe that the water table is higher than the water level in the wetlands that is true. It's also true that at times when the wetland is dry, and we know it does dry up, but if that hole exists, it acts as a bathtub drain.

Chairman Block: All right.

Russ Slayback: I think my point there is it really doesn't matter if there is a hole there or not, we've got what we've got.

Chairman Block: Thank you.

Dr. Ron Abrams, Dru Associates: Consulting Ecologist for the applicant. I submitted, or prepared over the weekend a response, we've been working on this for some weeks, a response to REMA's November 28<sup>th</sup> series of questions some of which we took down verbally and responded to the Commission in the letter of Dru Associates dated November 30<sup>th</sup> in which much of the field data and detail were attended. Then we continued to work on the various outstanding issues, and the letter submitted today, yesterday, dated January 6<sup>th</sup> was of course written and completed by January 6<sup>th</sup>, so it does not have in it what I am going to discuss that came to our minds as a result of the Connecticut DEEP letter from this morning and as you can imagine we spent considerable time today, all of us talking about how to respond and you see on the screen now the initial response was to withdraw development another fifty feet in the steep slope area that sits above basin two and also importantly adjust the lots so that the access of animals coming from basin two to the herp tunnel would be facilitated with the shortening of the herp tunnel. This withdrawal from the edge of the wetland is a bootstrap to a design that I was already convinced was protecting the wetland completely, but we are pleased to participate in any revisions that make all the parties feel better about the project, and I'd like to actually compliment BL engineers for being able to get that much done that quickly and make sure that it complies with zoning, the grading so that it complies with all of the work that has gone into blasting design and grading and earth works. Now I will step through, without reading in detail my January 6<sup>th</sup> letter.

Question one from REMA was: Since 2011 was an odd year hydrologically why was not at least egg mass counting completed in 2012? Well, first of all, 2011 since the turn of the century was not an odd year. You look at my rain fall data and my recounting of statistics and this area fluctuates from year to year from less than forty and more than fifty inches and rarely only three of those years was within the forties in terms of annual precipitation. So, maybe we were lucky, if we had not observed the fully flooded season, which was 2011 and in fact right now the wetland looks like it might be a fully flooded season again even though 2012 was dry. If we had not observed both of those conditions, then we would be concerned that we didn't see the full characteristics of this wetland, but we got a full year and a dry year and that's what has been happening for more than the last decade, so we feel we got the information that we needed. Now there is a comment here, REMA notes that the USACE recommends 3-5 years of data. Quite frankly I doubt, even Mr. Logan can point to many projects that he has worked on where you have the facility of spending three to five years on

a site before you bring it to a Commission for review and development. That's more of an academic study and in this case, it's neither practical or was it needed because we saw a full range of what this wetland is capable of.

Next question: Was a water depth profile over time generated using staff gage data? As you will not we began a couple of years ago with the idea of staff gages, they were stolen. But what we saw was that Basin three is dry right now, it fills up and dries right down, and we confirm by looking at the soils that their soils are fairly permeable so there would be no real gain in information from generating a hydrograph with staff gages in that basin. In basin two, as one of the public pointed out for us, at some point, it's got an overflow drain across the pathway, in the southwest corner and it doesn't vary more than a foot and a half or so in any year because the center of the base itself is so flat. So, no, we don't have hydrographs but we do have information and the flooding, and the extend of flooding in basin two is documented in the November 30 letter.

Next question: We noted an emphasis upon obligate vernal pool species in the herpetofauna survey that Dru Associates did were targeted species surveys also conducted for other important species in the area. Well yes, when we are asked to do a herp study to determine whether a basin in a functioning, quote, vernal pool according to Connecticut guide lines of course which focus on key indicator species. Those are the species we focus on, in this case, spotted salamanders and wood frogs demonstrated to us that it's a functional quote vernal pool as Connecticut DEEP provides in their guidance. My staff are always making observations on what other animals might be in an area and while we don't necessarily do intensive surveys because we don't need them to answer the basic question of the wetland function and the presence or absence of vernal pool indicators, we were constantly watching for what was out there and we found no four toed salamanders or spotted turtles. We noted that spring peepers were present and we could hear the gray tree frogs. We didn't actually see many green frogs to just review the species that were mentioned in commentary, but our general observation of this wetland is that the volume of diversity isn't as high as one might have expected in a pristine patch of forest such as this. We did see quite a lot of signs of human disturbance from garbage to ATV tracks to bond fire rings, along with cat and dog feces and pawprints, so it is not surprising that the wild life on this site is somewhat adapted to the cosmopolitan conditions surrounding it.

Next question: Could the applicant please provide the specific dates of the herpetofaunal and wetland inventories? Those are detailed in complete detail in the November 30 letter.

Number Five: In your opinion is Wetland 3 important from a metapopulation perspective to overall herpetofaunal survivorship at the property. Could wood frogs breed there in some years? No, I don't believe that is likely, I can't say it's impossible but in the two years we watched it there wasn't water standing long enough for them to go from egg masses to metamorphosis, and thereby become adults. However, basin 3 has the potential to be what we call a satellite to basin two. A satellite is when animals are migrating and of course the ERT report and REMA's materials have raised the question of what happens in terms of these animals and migration away from basin two. These animals could move, some, a few of them could move to basin three in their migrations on their way, looking for a new home. Of course those long distance migrators will find Russell Road and the highway and we really don't need them to go that way because they won't live that way. So, no I don't think wetland three or basin three is particularly important and in fact, one of our reactions when this question was discussed within our group, was, be a good idea to give them somewhere to go, a new satellite that takes them to some place where they can survive, which would be southward which is why we proposed a mitigation basin to the south of basin two and while

we are preserving basin three and allowing them to get there through the tunnel, it would be better for them to go south.

Numer Six: Regarding the proposed amphibian tunnels, could the applicant provide research that shows success for similar applications, in Southern New England and for the targeted species as well as discussion of important design criteria such as length, width, substrate, moisture, etc.? In the Dru Associates November 30 letter we provided some information. As for examples from New England, research from the northeast United States does concur with what the federal government put together which is a manual of some 400 or so pages, published by the Federal Highway Association in 2011 which fully vets this issue for all sorts of wild life crossings and has a chapter on amphibian tunnels. We are in compliance with that, in fact, we were in compliance with those design criteria before the changes made now which were to shorten the tunnel, widen and facilitate the access to it, and thereby take us further along the line of compliance with the FHA's guidelines on wildlife tunnels. When I first began consulting in 1986 the concept of herp tunnels was only heard of in Europe. It took twenty years for the United States to catch up. The Federal Government has put together comprehensive research and if you have this issue come up before you again, I suggest Mr. Greenlaw get a copy of the FHA manual. It covers all sorts of wild life, road crossings, and all of the things that a highway administration might and should consider.

Number Seven: Did you characterize the substrate in Wetland 2 and develop a profile? Let's get to that presentation...as you heard, yes. There has been further data collection by REMA and Dru Associates together and by REMA unilaterally. In my current submission dated January 6<sup>th</sup>, is a new appendix which presents all of the soil data, but I'm going to review it now for you with the new information gained and if you will notice in this slide, the east/west transect points up into the area of steep slope that was a matter of concern in the DEEP letter to which we responded by drawing back the development back from the edge of the slope and the E1, E2 and E3 samples are the soil samples that continue to be the subject of discussion and while REMA has outstanding questions on this issue, we don't, we're fairly well convinced with what we found. This soil sample, that's my hand, that's my glove so that gives you a scale of the soil sample, this was taken with the auger, the stainless steel oak hill auger that I use and have been using for twenty-five years and have used for, I can't even count the number of federal and state wetland delineations and we find it a very effective tool. Now if you look closely at this sample, you will see that the outside is as Mr. Logan has characterized the greasy wet layer. Of course, that's because it is drawn up through a wet hole. The dry core is my evidence and from the next hole over, I'll go back to my diagram, you will see E2 and E3. E3 was a sample that I took myself in the beginning and then Mr. Logan took his own sample and then verbally said, yes he agreed with me on E3. E2 is the one where the dispute has arisen and I don't know folks, that is dry, dry, dry. You don't get a layer of material under a wetland that is dry unless it's a confining layer and that's our evidence and remains, we are convinced that we have a confining layer, the name and fancy terminology notwithstanding, that's what we think of our evidence, our conclusive evidence for characterization of the wetlands.

Chairman Block: What is the actual size of that sample? It looks like it is about an inch or so.

Dr. Abrams: This sample is about two inches, it's similar in size to this one which, again, there is the palm of my hand. So, yeah, it's maybe an inch, inch and a half, because of course the auger is about two inches wide, so you take a string of soil out of the auger, and break it open and look at the inside. Yes, if you grab it, it's greasy, but the inside of these samples was always dry, which I showed Mr. Logan in the field and he didn't answer me that it wasn't dry, I'm not sure what he thinks until I guess we get his report from the field data.

Chairman Block: At that location, you said fifty inches. Where was refusal ?

Dr. Abrams: Well, with a hand auger we didn't get to refusal but we understand from Mr. Logan and he took other equipment which he has not yet described to us so we can't tell you what it was, that he reached refusal at about eight or nine feet and what I've done is a schematic drawing here of what we think of this wetland. Running along that east/west transect, I'll go back again so everyone can see, east/west transect, E1, E2, E3, and here is my characterization of it which I have discussed with Russ Slayback and he agrees with me, you have the top of the hill which would be the soil surface and the second line under it is the rock surface which is high on top of the hill and descends as the hill goes down, and underlays the wetland, but if you look at the blowup to the lower left of the screen, you'll see the water line which is the dotted blue line, the location of the samples and our opinion that we have a soil layer that has a confining layer, that's the brownish gray layer, and then below that, another few feet down is ostensibly rock according to Mr. Logan's December 28<sup>th</sup> report and the red line on the left of the screen is how we envision the soil water seeping through the surface layers of the soil, reaching the edge of the basin, and laying on top of the confining layer. This is how we characterize the wetlands, this is what our data has shown and we've seen no data yet that shows us anything else.

Number eight, Question eight: In a large and complex vernal pool, spotted salamander egg masses tend to be located on the shoreline near the terrestrial area from which they migrated. Amphibian densities differ along terrestrial areas, depending on habitat quality. Did data collection take note of the shoreline locations of the egg masses? The answer is yes, the dispersion of the egg masses was reported with graphics in our November 30 letter and there was a preponderance of activity in the southwest quadrant but I am not necessarily in agreement with Mr. Logan's contention about egg masses being located on the shoreline near the terrestrial area. In the 1990's I put radio tags on salamanders and tracked them, and they are very surprising how they move around the pond and in and out of the pond. They don't necessarily stay, live in the edge where they merge. They can move left or right depending on where the shrew or other burrows are that they are using, but I did provide the data for his use.

Number Nine: Do you have a graphic showing the edge of the breeding habitat embedded in the overall wetland? Yes. Also showing where the minor-trapping was conducted and the distribution of the egg masses? Yes, these were in the November 30 letter.

Number Ten: Did Dru Associates staff sample the vernal pool water quality? If so, which parameters? Can the results be provided? The answer is yes, those are in the November 30 letter but I will discuss water quality testing a little later.

Number Eleven: In an attempt to understand the hydrologic regime of vernal pool two did the applicant consider the use of piezometers? Yes this was discussed by Russ Slayback and the use of piezometers was rejected because it is inappropriate technology in this place and time, and we are not in favor of just collecting data for data's sake.

Number Twelve: We ask the applicant to produce a comprehensive hydrologic budget for Vernal Pool 2 and 3. We want to make sure there are not significant quantifiable changes, and you have heard from BL Engineers, extensive work on assessing and quantifying the drainage and I would leave that to them.

Number Thirteen: In the geology review in the ERT report there is a discussion of the basalt that has been highly fractured. How could this potentially affect the hydrology of the vernal pools and the potential changes from blasting.? Dru Associates stated that they did not think

ground water contributed to wetlands two and three but did not explain why. First of all, as Russ just now tried to explain, there are different concepts for ground water. If you look at this trace, the general topography of the site, some where down here is deep bedrock which is saturated. I don't believe that the bedrock is saturated up this close to the wetland because it is a hundred or so feet down to the steam, which means if there was always deep ground water, and when I say deep ground water, I'm talking about water all the way down here, all the way up, not just lenses, or patches. True deep ground water goes all the way, five hundred feet or more. If there was ground water packed in here, that was influencing this wetland as I think Mr. Logan implies, the stream would never dry out. That was the point that Mr. Slayback just made about the slope. If you have all this water trapped in here, trapped in bedrock and all the way down, then this stream will never dry out because you always have water coming. The steam does dry out. The deep ground water is down in here. Not up here, not up here. It's down in here. In our work now we are talking about water trapped in the top layers of the soil, yes, some of that water could lie on the top of the rock, but we're not talking about water in this rock. We are talking about the water that is trapped in the soil and when we get a dry year there is not much water in the soils, this is not a very big watershed, so this wetland dries out, it's all very logical. To take that a step further, this confining layer is made of an elastic or gooey material. Vibrations from 150 feet away are not going to break that up, so whether this is a complete confining layer or there is a little hole of gooey material, greasy material as Mr. Logan has termed it, doesn't matter. The blasting won't do anything to it, even if you shake it, it's not going anywhere. It's not breaking, it's not draining the wetland.

Number Fourteen: How will you ensure that the sediment forebay sumps, which would likely pond water in the spring of a given year, will not become decoys and ecological sinks for the vernal pool obligate species? Well, in our experience and in our opinion is that this is a straw dog that is thrown up by many opposition consultants. I've been doing this for twenty-six years, I have not had the experience where basins that were created for another purpose become homes to animals unless there are so many animals that are not happy or overflowing with their original home. However, there are mitigation measures that we can undertake and we are prepared to do called herpetofauna barriers. We can install and we are prepared to install barriers that will keep the animals where we don't want them, keep them out of the developed areas, keep them out of the storm water features.

Chairman Block: Could you explain what those are please?

Dr. Abrams: Yes. The Tanger Outlet Center in Riverhead New York we constructed barriers around a thirty-three acre tiger salamander preserve which is an endangered species, which by the way, spotted salamanders and wood frogs are not, they are not listed for protection in this state or New York. In this case we had to keep the salamanders out of the outlet center, so what Mr. Tanger did was employ a curb construction, the same kind of machine you would use to install curbs. It goes down ten or twelve inches in concrete and it rises up twelve or fourteen inches. So burrowing animals can't get past it, and small animals can't climb over it. That project was completed in the late nineties and there has been no reports of animals getting out into the parking lots, so it is quite feasible to do a permanent barrier. Temporary barriers I'm going to recommend should be used during the preparation for construction. If we time everything properly, we can get the animals, most of the migrating animals out, as they come out of their upland burrows, towards the wetland, we can install what is called griff fences. The fences have, every fifty or so feet a bucket up against them. The animals come along, the griff fence goes into the ground, silt fence on the surface is not enough, you've got to go deeper, animals come to the fence, they meet it, they turn left or right, they move along, they fall into the buckets, we visit the buckets every day, we take the animals and where we want them to go is where we put them, no harm, the technique is approved by the federal government and each state government. I've been licensed by the State of Connecticut to

use this method before and so we can do short term and long term protection of these animals in terms of not letting them go where we don't want them to go.

Commissioner Paskevich: Excuse me Dr. Abrams, who is going to conduct that?

Dr. Abrams: Well, that remains to be seen, but I've done it, my company has been doing it for twenty years.

Commissioner Paskevich: You mean hired on board, on site forever?

Dr. Abrams: We don't know what the permit conditions of the requirements will be, but yes, I have worked, I have participated in post construction monitoring that lasts numbers of years. During construction and after, that will be something yet to be determined.

Number Fourteen, Number Fifteen: Our field investigations of Wetland 2 showed a very complex and large open water area, difficult to move through due to dense buttonbush, such that a wood frog raft or isolated clusters of egg masses could easily have been missed. What was the method used for egg mass searching? How closely spaced were the sweeps? Were they done by more than one researcher? Yes, the dispersion of egg masses was fully studied by a team approach where we overlap each other, we keep talking to each other, we don't miss, now I'm not claiming that we can't miss something, but the purpose of this herp assessment was to determine if they were there, relatively how many, an estimate and you will see that my population estimates offer a wide range of numbers, I don't say there are 422 or 81, I give a range of numbers in my final conclusions and we're very experienced, my staff and I have been doing this for over twenty years, we feel our field methods and I did of course detail this in my November 30 letter, we feel that our field methods were fully adequate to make sure we got a fair characterization of what was happening in basin two, and quite frankly what we found was quite a good abundance of wood frogs and salamanders, so we achieved the objective. Is it a functional vernal pool in terms of the guidance from Connecticut DEEP and our answer was yes.

Number Sixteen: Did you record water depths at each of the egg masses encountered and whether they were attached or free floating? Did you record how many of the spotted salamander egg masses were opaque versus clear? We're not quite sure what the value of this was, but the answer is yes. We took those notes. When flooded that basin is between twelve and sixteen inches as Mr. Logan observed with me at the end of December. The spotted egg masses that we saw, the spotted salamander egg masses were pretty fresh and when we made our observation, so they were all clear. Cloudy egg masses usually reflect after freezing, which we did not observe when they were all new, looked like a pretty health function of egg masses.

Number Seventeen: In calculating salamander numbers, how did Dru Associates take into account the fact that not all salamanders breed in any given year? The simple answer is that my conclusions had ranges of numbers. I don't know the numbers off the top of my head, you have all those reports with you, but I'm no fool, I know that we don't know exactly how many there are, but by giving a range, and by thinking about sex ratio and the fact that animals don't all come out every year, we feel that our range of numbers presented do the job of answering the question is this a functional vernal pool according to Connecticut's guidelines and relatively how abundant were the animals. Those answers we have provided.

Has Dru Associates researched the effects of stress on trapped amphibians in minor traps about to breed? Can breeding activity be inhibited by such stress? First of all, the answer to the second one I think is no. The breeding activity is not inhibited. We have seen these

animals breed in the most bizarre places, under the most bizarre circumstances. We found so many of these animals throughout the whole southern part of the state that the New York state DEC had to take them off the list. They are very resilient, very hardy animal and I don't think that the breeding activity would be inhibited by stress. However, we did not do a lot of trapping. We don't do a lot of trapping for the reason that we are concerned that we might upset the animals. We do only as much trapping as is necessary to determine when to look for the egg masses. If we just went out and guessed, oh, let's go out and look now, and see if there are egg masses, let's go look now and see, we would waste a lot of time and never be sure that we got the right part of the breeding cycle. So we put the traps in a few times a few times, again those details have been given to REMA and they are in the Dru Associates November 30 letter.

Number Nineteen: The Dru Associates report stated that the remaining uplands will continue to support the existing population level of amphibians. Does this statement mean that the remaining post-construction population will increase in density until overall population size is the same as it is currently? Well, I'll answer that first question. Yes, of course we are aware and we have been it ourselves, that after a development the animals spread out into the (inaudible) they have, and as resilient as they are, they repopulate and return to similar levels. We have had some projects where we have monitored after the fact, mostly we're not asked to do that, but we have, so we have seen it for ourselves. The answer is yes, we are aware of it and we do believe that after this project is developed the population will recover if it's even been diminished by the project, but it will recover. The last, substantial unavoidable mortality will take place (over 40 percent) during grading of the terrestrial habitat of subterranean spotted salamanders. Well, I don't agree with the forty percent, if REMA has data on that it would be interesting to see because it hasn't been published, but the animals will respond as many of us have seen, populations will recover.

Number Twenty: Did the impact analysis take into account the substantially increased mortality of juvenile amphibians that will head east and northeast from the pool? Juveniles move randomly and cannot avoid developed areas. Yes, the juvenile mortality is accounted for in the broad range of the population estimates that I provided in our original herpetology report. The mortality of young amphibians is naturally very high and since these species employ a strategy of producing large numbers of offspring to overcome this reality it's our opinion that the large number of youngsters moving south and west will compensate over time for any losses from those moving out which is in fact partially responsive to a prior question that says will the population recover and the answer is yes twice.

Now under the Wetland functional assessment section, which I can contribute to but it wasn't my original work.

Question One: Why did the applicant not inventory the wetlands during the growing season when there was ample opportunity? Well of course, Dru Associates did so. It wasn't a formal inventory, we never found the need nor were we asked the question to give a complete species list. We've discussed our results, again in the Dru Associates November 30 letter that details how much time we spent in the field, so we do believe that we were completely aware of what was going on in the field and what the animals were like and that was our assignment and our objective was to characterize the vernal pool.

Question Number Four: How is the statement in the Dru Herpetological Assessment, very few aquatic invertebrates were observed in this wetland, consistent with the observations of abundant snails and mosquito larvae. Well, snails and mosquito larvae are two species. Our report refers to the numbers of species, the diversity, not the total abundance. And yes, we would agree, when there was a small amount of water in basin three there were hundreds of thousands of mosquito. To me, that's not really a very significant ecological finding, so I'm

not really sure what the purpose of that question was. I will say this, none of the wetlands on this site are extremely pristine or diverse in a biodiversity sense. But I will come back to that.

Under Other topics, Has the applicant considered putting together turf management and integrated pest management recommendations to be forwarded to each of the new home owners by the home owner's association, given the sensitivity of the site? The answer is yes. I have talked with Dr. Marty Petrovic of Cornell University who was one of the inventors of the concept of ITMP's. Dr. Petrovic said to me, and both Russ Slayback and I have worked with him extensively on major projects, he will prepare for this project an ITMP, however he can't do that until he knows what the layout is going to look like because what an ITMP consists of is as follows; Marty calls me and up and says, okay, I need a sample from, he takes the site plan, the conceptual site plan and he marks it up and he says, I need a soil sample from here, here, here and here according to these parameters and I ship it to Cornell. He does his own soil analysis, and by the way, he warns me that soil laboratories have very, very, varied methods, protocols and results and warns me to be careful of that. The Cornell lab does the analysis, he prepares what amounts to a recipe where he describes the chemicals or applications that are on the market and available, discusses their proper use and gives specifics about which ones will and will not be useful or harmful or acceptable on a given site, so this is a study, this is a document that is very specific to the exact site, to the exact layout of the site. It's not generic, it's not vague, it's a recipe for, if this happens, Newington Walk. Okay, some other matters that came up in the interim since the November 28 memo, I was handed water quality tests by REMA for basin two and a concern was raised about this. Now we did report our field meter readings of dissolved oxygen, temperature and pH. The wetland is subject to widely varied hydrology from season to season and from year to year within the same season and within the same year and while the pH is stable due to the long geological history that laid down the site's mineral soils, which control pH and act to hold water in the basin, the oxygen contact varies widely as the basin floods and dries, and temperature follows accordingly. When a flooded basin freezes in the winter it's different than when it doesn't and in the summer they reach very high temperatures. All of these variations make any single point in time sampling, well, it's interesting but it's useless. I really didn't understand why REMA took those results but I took the results and compared them to the 2011 Connecticut Water Quality standards for trophic state. Trophic state is a descriptor of the ecological condition of a body of water in this instance. The definition of trophic state used as an indicator of the condition of surface waters can best be explained as follows: the more eutrophic a body of water, the more degraded and threatened it is. In other words, eutrophy is when you have excess of one particular nutrient that is out of balance with the natural balance. So the biochemistry of the system can't handle that extra nutrient or compound so you get a result that you might not like, such as an algae bloom. So, what did I see in REMA's test results? The nitrogen in the stream would tag the stream as misotrophic, it's not quite eutrophic but it's not oligotrophic. Oligotrophic is clean, new pristine, eutrophic is not, misotrophic is somewhere in between. So in terms of nitrogen, the stream is misotrophic. And in terms of phosphorus, it's eutrophic, it's already degraded. In basin two the nitrogen and the phosphorus are way off the scale, they are highly eutrophic. The basin is already seriously degraded, at the point in time that REMA took these samples. Moreover Connecticut's Water standards provide that the heavily vegetative habitat is often labeled as eutrophic because it's reflecting the fact that it has a lot of nutrients and the plants are growing on these nutrients. So, according to what we have so far, we are looking at a pretty degraded system and that made me wonder, why? So I looked at the history of this site, there it is folks, 1934. On the right, I just want to let you know, this is from Google Earth, a website called historic aerials and from State of Connecticut web site, all freely available to anyone who wants to climb on the computer. If you look at the left side of this screen, you will see a patchwork of agricultural lands. That is the site that we are talking about. This is not a pristine forest that we are looking at, at Newington Walk. The place was cleared,

altered, farmed, grazed, lived on, and look at the size of the wetland in the middle. Just keep that in your mind as we go forward. Here's 1960's, look at the western section, where the stream is, it's still fairly cleared as if it was pasture or agriculture, what we are seeing at Newington Walk is the re-growth of forest that was completely cleared by the twenties or thirties, in fact, most of the northeast United States except for the White Mountains, Green Mountains and Adirondacks was cut to the ground by the colonials.

Commissioner Paskevich: Dr. Abrams, I'm just going to interject. Agriculture is not cut and fill and blasting and development and pavement, sorry. This is not really showing us what we are doing with the land now.

Dr. Abrams: If you want me to stop I will.

Commissioner Paskevich: No, you can continue but that is my point.

Dr. Abrams: Here we are in the nineties, and it started to grow back in, but notice, the wetland is growing back in too. We're watching the re-growth of woodlands across an area that was cleared and it's going to continue, it's continuing today, the re-growth of a woodland, along with vegetation, the shrubs, ironically, not much of a understory in much of this woodland which is interesting. Here in '91 you can see it again, and you can start to see the shape of this wetland as we know it today taking place as more and more vegetation grows in. Take a good close, in the '90's it looks more like now, although the western watershed is not really fully grown back in. My point of this folks, is that the eastern cottonwood, the swamp cottonwoods that is growing here is not going to last if you don't do something with it. And that came from the DEEP letter itself. What's more, I heard Ms. Gadwa say that in the field that we might need to take out some trees so that the cottonwood doesn't get shaded and one of their concerns was will we maintain the level of flooding so that the character and the vegetation continues to be as it is. But the character of the vegetation that we see in this one point in time is not going to stay the way that it is. This is going to grow in. That's just Mother Nature which is why DEEP recommended that whoever manages this wetland take out certain trees over time. Now this brings me to a very important point, when the federal government created the endangered species act, Congress required that whenever (inaudible) list of species, a management plan be written for that species, so there was not an open ended, we're going to protect the species forever and don't care what happens. We have to take care of the species, we have to take actions for the species, which is what the DEEP letter has suggested, and in this case that means manipulating this wetland. Going in there and making changes, taking out species that are growing there naturally, that have been recovering for sixty, seventy, eighty years, taking them out so that the cottonwood can continue. The reason that Congress wanted these management plans is because of course if you are going to go in and manipulate habitat for one species, what are you doing to the other species and this question is now going to be important when we think about what is going to happen to the cottonwood in this basin. Please understand, this cottonwood shouldn't be here. The reason it's endangered in Connecticut is only because it's at the very northern limit of its geographic range.

Commissioner Paskevich: But also, that species is wind pollinated. That species is wind pollinated by the male, so the seeds can travel from anywhere from another area and continue growing in that area.

Dr. Abrams: If the conditions are right, and since there are what, a handful of populations in Connecticut, that means there have been a handful of places that by luck the seed took. But, since this plant doesn't want to be shaded, if you want to preserve this wetland, if you want to

preserve this species, in this wetland you are going to have to go in and cut out the trees and shrubs that are going to shade it.

Commissioner Clark: Isn't it true though, we're seeing a lot of species, including bird species that are trying to push the upper limits, coming from the south, because for those of us who believe in global warming, due to global warming.

Dr. Abrams: Well climate change is happening and anybody who says it isn't is just ignoring the last two years of our own experiences, and your question about the spread of the species is a good one, and perhaps Connecticut will adjust their endangered species act to account for that, but that hasn't happened yet and quite frankly I believe that if it were possible to document this and publish it, it would have been done. It's just too early for us to draw a firm conclusion but it's also kind of awkward to ask a landowner to plan his development on the possibility that climate change is going to change the ecology. So you're not wrong in what you say, but I don't know how we can make use of it in this context.

Chairman Block: To go in that direction, if it is global warming then this southern species is going to have an advantage and be pushing out more northerly.

Dr. Abrams: Well, I don't know what you mean by pushing out.

Chairman Block: Well, it would be growth advantageous.

Dr. Abrams: This species has a disadvantage. If you shade it, it doesn't do well.

Chairman Block: Right, but in warmer climates it is more competitive, if you will.

Dr. Abrams: In warmer climates, to quote Marty Petrovic from Cornell, it's extremely aggressive.

Chairman Block: Right but on the other hand, if the manipulation of the wetlands is something that is to be done to preserve the advantage of this rare species in Connecticut, then we can also manipulate the wetlands to dredge it out, get rid of the mosquitoes and have a nice fishing pond.

Dr. Abrams: That is possible too.

Chairman Block: Okay, so the question is, what is the balance?

Dr. Abrams: The balance is the question that you face. That's right. There was one more topic that I was asked about, and that is the pollution loading model that REMA recommended. Dru Associates has already submitted this information. We employed the Scheuler Simple Model, simply method, widely known technique of mass balance analysis of how nutrient and sediment quantities behave under certain development conditions. It was developed by the Metropolitan Council of Governments in the 1990's based on thousands of field and laboratory experts across the country under the auspices of the Federal Government's Nationwide Urban Runoff Program known NURP. This method which we use compares the undisturbed woodland condition to a modern suburban residential development that employs standard BMP's. So the results that are in my model that are in the table that we produced do in fact include measures for reducing loading according to standard BMP's. My comment on the whole issue for this project is that in fact we have many, many more BMP's than were envisioned in the 1990's and I think we have more than

adequately compensated for any loss of nutrients or unnecessary or unwanted transport of nutrients into the wetland and again today we made further revisions to the plan to further protect the water quality and Ray's analysis of the treatment train gives you a handle on how well we can remove pollutants from the storm water train. Bear in mind almost all contaminants that might travel to a wetland are contained or absorbed onto sediment particles and if, as Ray has shown you, we successfully remove the sediment particles from the treatment train we are thereby protecting the wetland from excess nutrients. I think Ray, that is what I have. That's all.

Commissioner Clark: I have a question about the mosquitoes. It sounded like your observation was that there were quite a few mosquitoes and larvae in particular. Since the homeowners are probably not expected to treat this area with insecticides, how have you seen the mosquitoes population of this quantity affect a development?

Dr. Abrams: With the size of the setback that we have, I don't think it would be any different than somebody who buys a property on the waterfront and needs screens in their house, but I don't think you would find a situation where nobody can go out in the backyard. It's not a tropical condition, and it's quite seasonal. As these wetlands dry down in the spring the mosquito populations will fade and, sure the people will want to have little bug sappers on their back deck, and so forth, but you can go all over the state, all over the east coast and find many, many people living as close, or closer to wetlands as will happen here. I don't see it as a particular problem.

Chairman Block: Thank you.

Ray Gradwell: That's our presentation Mr. Chair.

Chairman Block: Thank you very much. I suggest.....

Attorney Regan: I just wanted to say at this point, that's all the, the new information that we presented in response to what was presented in the past, and if there are any questions from the Commission the consultants are available, but I think that is anything new that we got as of 7:03 letter this morning.

Chairman Block: Thank you very much. It was really very responsive to the prior public hearing. I would like to suggest a ten minute break. We're in recess.

Chairman Block: Once again, I'd like to move this along. We have a representative from the Town of Wethersfield and I'd like to have him speak up at this time and then we will get to the town's experts, and then long evening that it is, we will hear from all of you good folk.

Attorney Branse: Thank you Mr. Chairman. For the record, I'm Mark Branse, I'm representing the Town of Wethersfield and I'm joined this evening by Jeff Bridges, the Town Manager of Wethersfield and Mike Sherman, the Director of Public Works and Town Engineer. Basically I'm here, I'll be very brief, I'm here to update you. As you know, the main concern of the Town of Wethersfield has to do with long term maintenance of the various water control basins, water quality basins because a significant portion of the site does drain into Wethersfield and it's wetlands. We have received a draft document from Toll Brothers that would, that is intended to ensure the long term maintenance. We have reviewed it, we have provided our results to Toll Brothers. We will be meeting this week to discuss the terms, we're really quite close on that. Our objective, we did copy Chris Greenlaw on that, in his capacity as Town Engineer, not in his capacity as your staff, so that he would, we don't want to anyone to feel we are doing end runs around Newington in these discussions, but our

objective, and I believe Mr. Regan will agree with me, but our objective is that when we are in agreement on a document that we will submit it into the record of this hearing as a formal exhibit. At which point we know that Mr. Greenlaw will formally review it for you as your staff. We didn't want to put anything in the record until something we were both comfortable with and we both feel is workable. Our objective here is not to tell you how to regulate wetlands in Newington, that is not our place. We are looking to ensure that water flowing towards Wethersfield is in a long term protected, in terms of it's quantity or quality. We also know that the plans are in flux. One of the documents that Toll has promised to get to us is a maintenance plan for these detention ponds, because as you saw this evening, now a berm, two berms have been added to the water quality basin, so we understand that they can't do a maintenance plan until the design is finalized. We understand the obstacle that they are having. They are getting letters continually from your consultants and others and they have responded to those, and we realize that that makes it very difficult for them. We know these hearing are being kept open, I do hope that by the time of your next hearing that we will have something that we can provide to you jointly that addresses the issue we raised.

Commissioner Block: Just for my own curiosity, the original issue that I heard Wethersfield bring to us was that they had had experience where a home owners association went out of existence, leaving the maintenance to the municipality.

Attorney Branse: That's correct.

Commissioner Block: Are you know saying that cooperatively you have come up with language which you believe would resolve the maintenance of those basins, if the association in Newington went out of existence.

Attorney Branse: Yes, that is correct. That is exactly what we are looking at.

Chairman Block: I'm looking forward to hear.....

Attorney Branse: I think you will be very pleased with our work. Did I correctly summarize that?

Attorney Regan: As always, Attorney Branse is accurate, and in fact just to elaborate a bit on the Chairman's comment, we have come up with a mechanism that we have used before in other municipalities that gives the municipality the right if there is a problem with the detention basin to go in and make corrections and then lien the individual lots for responsibility and in this instance we're going to be very creative in that not only are we going to give the Town of Wethersfield the right to do that but obviously we didn't feel it was right to give the Town of Wethersfield the right that the Town of Newington didn't have, because the property does lie in Newington, so both Newington and Wethersfield are going to have rights to go in and enforce the detention basins if for some reason the home owners association doesn't comply with what it is supposed to do, and those will be recorded documents on the land records and will run with each of the lots, so that will secure that.

Chairman Block: I assume that will be and/or the town.

Attorney Regan: And/or either town, that is correct.

Attorney Branse: And the way that it is drafted, Newington goes first because it is your town, but the reason that we are not concerned about worse case, if the home owners association ceases to exist, or has no money because we have the mechanism to proceed directly to the lot owners.

Chairman Block: I believe Mr. Hosley our blasting expert is up next.

Richard Hosley: Thank you for the opportunity and I'm going to take up a little time to set up my computer to put together a little presentation. I sort of think in this situation that a picture is worth a thousand words, and I'm hoping that will suffice.

I want to start out by stating to the Commission and the public that is here attending this meeting that there's a lot of technical information that is going to require very length discussions to analyze and I've had a great opportunity in this forum, this forum meaning the public meeting, and the opportunity to converse with the consultants for the applicant, the town engineer, to test the verbiage, test the layman's understanding of how we migrate through this application, future applications, the issue of development, the issue of blasting, all of these things are very important to our society and how we migrate forward with many decisions that affect not only our community but other communities in other states. In essence, we are setting a precedent by establishing the procedures by which we are moving forward. Is this a good idea to look at this, is it a good idea to change the ecology of the wetlands, should we cut back some of the trees to preserve this or to do that. These are all of the macroscopic decisions that we as human being have to make and moving forward, I have a lot of information, and I have a lot of things to discuss and I can migrate through this quickly as I plan to, but I ask the Commissioners to please raise your hand, stop me and I can get into detail if you have questions. I'm a little jealous of Dru Associates because they had twenty questions. I really only have two questions that I have to answer I think, but those questions as you see are quite broad. I've been contracted by the Town of Newington, the Conservation Commission to review the development plans, attend these public hearings, conduct a site walk, analyze the hearings, the recommendations, the findings, offer professional expertise, have consultations with the staff, with the experts from the applicant, and one of the most difficult challenges has been offering literary references. I have many years of experience of which I can discuss and relate to, but if I can present what Chris Greenlaw has asked me for, specifically are literary references. Where has this been done before? Give me proof, give me a reference, where can I review it, where can I find it? The big question is, can blasting be conducted up to 100 feet from a wetland without causing damage to the wetland geology or the geology underlying the wetlands. Now we've heard tonight from the applicant that they are looking at 150 feet based on other recommendations, not focusing on blasting, but focusing on other recommendations. We've heard comments and recommendations from the applicant's blasting consulting, seismic consultant of which I've done a bunch of work with, through various meetings during this process and agree with. It's not to say that I'm not anxious to get some of the information that was presented so that I can scrutinize it, more for typographical errors and keeping details within fashion relative to limits. You know, it's very easy to post a speed limit on the street, and qualify that that's the correct speed. You get a ticket, but with some site specific concerns, it's very difficult to do that, so what we are trying to do as a group in this forum is really nail down what the speed limit is going to be to protect this wetland. So I'm trying to present you with that information and there is a lot of that. Essentially will blasting for this proposed application fracture the rock outside the construction zone into the buffer area, into the wetland area, and redirect the flow of water or drain the wetlands. Well, the answers to these questions, hopefully I'm going to submit to you, but I need to clarify that I'm a blasting professional. I grew up in the explosives industry, as a kid I watched my grandfather blast, I watched my father blast, and I've been in the trenches most of my life. I represent the rubber that meets the road. We talked a little bit about test drilling, I've test drilled between fifty thousand the two hundred thousand holes a year, every year. We don't typically call it test drilling, but in some case we do, and when we test drill these holes that range from three feet to a hundred feet in depth, probably average about twelve feet in depth, we're checking for water, we're checking for

inconsistency is geologic structure, rock type, all different types of realms that would affect how rock is, how it performs under different conditions, that sort of thing. So the first thought in my mind, and most of you folks have the details and know this because the history of this application and the history of your interest here in Newington. What are we blasting? Well, the geologic setting, what is the rock type, what is the rock structure. Rock structure, cracks, seams, joints, changes in elevation, topography, that also is relative to rock structure. We know where the site is, it's a trap rock ridge line. Keep in mind, trap rock is a mining term used to describe aggregate. Aggregate is crushed, it's trap rock is focused on crushing and the use of stone, not geologic term. Basalt, which is the rock in this area, is chosen as an aggregate because it breaks well during blasting operations, it's strong, it's hard, it's resistant to weathering. Geologic term, basalt, geologic name, Holyoke basalt. This rock is defined and I define this, it's an extrusive rock, extrusive means that it was extruded on the surface of the earth, came out of the surface. What happens when something comes out on the surface? It cools quickly. When it cools quickly you don't have the opportunity for minerals to separate, crystals to grow, seams or changes, you have a very consistent rock type. An extrusive basalt is very consistent, it's fine grained. You don't have those crystals changing and growing. You get geologic structure and the structure that you have witnessed here in Newington in the Holyoke basalt, it's a tight structure. There aren't big openings, you don't see a lot of caves, it's very unusual, there's very low porosity, it has a high compressive strength. When you hit it with a hammer the hammer bounces back, and it has a little ring to it. It's characterized by vertical columnar joints and cracks and this information can be researched for you folks that need a reference through John Rogers and his bedrock map and the work that he has done. Familiar to most of you coffee drinking folks is the rock cut behind Dunkin Donuts. What you see in this white face is a joint precipitate that has occurred during the movement or cooling of this rock mass. This photo demonstrates only minor fragmentation that goes beyond the rock face. You will see, if you go up and climb this rock which I don't recommend, that you cannot get beyond where they have excavated. You cannot get beyond the construction site. It's very tenacious. If you go up on top where the fence is you will see very little earth has been disturbed beyond the construction site, beyond the property line, beyond the fence. You will see that if the water hasn't been changed in it's direction to the trees on the top of the site, that they are living and moving and existing just fine. Some hydraulic conductivity occurs in this basalt, but it's very limited and typically in my opinion, very minor. It represents run-off, the same way water would run off this table if we spilled on it. In my opinion, the basalt on this site represents an aquaclude. What is an aquaclude? Well, if you take a look at this rock mass which I believe is the same cut that is behind Dunkin Donuts you see a little seep in it. This is pretty unusual. They exist, I'm not saying they don't, but it's unusual to see water migrating through this rock. I substantiate that with my own experience from thousands of holes that I have seen drilled into this rock mass and checked for water, hardness, changes in drill rate penetration, when you hit soft beds or hard beds, they do exist. Aquaclude, a solid impervious area underlying overlying aquifer. What is an aquifer? Aquifer is not water, well it's an underlying layer of water bearing rock, so keep that in mind. Back to water, water wells drilled in trap rock don't typically yield water. Yes, there are exceptions to the rules and every thing is site specific, but I think if you monitor the number of water wells drilled in basalt you would see that the yields are very low. The water is just not there. This wasn't my focus of the application, but I think this is important in tying things together because water doesn't migrate through it, explosive gasses will not migrate through that, and I will demonstrate why I think that is true based on some photos and some research that is done. This is the example of the rock that you see most days if you migrate through Route 175 in Newington. What you see in this rock cut are the half rounds we call them, the drill holes that remain from the explosive charges that were utilized in creating this rock path that you migrate through in order to transport yourself from one end of town to the other end of town. These half rounds which don't exist in all geology, are all geologic settings, are a fine example how the explosive energy has not migrated beyond

where the construction and excavation took place. Yes there are plans and principles and designs to prevent this, and I think as we migrate further you will see that presented by the applicant as refined by myself, the town engineer and the applicants consultants, blast consultants, blast engineer, that sort of thing.

What Chris asked me to do is provide literary references. What is going to deform the rock under the wetlands? Is it going to be ground vibration? It's not going to be ground vibration. I'm sorry to say we've got research to prove it. Ground vibration is not going to change the rock under the wetlands. What's going to change the wetlands is lifting the wetlands up and dropping it. If you pick up a piece of, if you are working at a piece of geology that is layered and has beds like this pad and you put gases into those beds you will lift them up and heave them, that will cause damage to your structure. Your structure could be a house with horsehair plaster, it could be a high pressure gas main, it could be a wetlands. Keep in mind, ground vibration ground vibration isn't going to do it, heave is going to do it, fly rock is going to do it. If we throw rocks into the wetlands, we're going to change the scene of the wetlands, that is something that we are going to try to avoid. Here are the references you wanted Chris, here's a copy of the book. Fortunately for me, back in 2001 the author of this book dog sat for me and my wife while we were out gallivanting somewhere, I'll have to ask him about that, but this work has been studied by multiple engineers and research companies and it has been supported by the United States Bureau of Mines and is available for you all to look at via the internet. The most distant effects found in the extensions of existing cracks with maximum cracks extend eighty to one hundred and eight (inaudible) bowl diameters, or fifteen feet from the most from the blast. I think we heard the applicants engineer say, ten feet, this is the rubber hitting the road right from David Siskin and the research that has been done. Particle velocity at this distance, fifteen feet, range between 11.8 and 15.7 inches per second. What does that mean? Well, the government, including David Siskin researched the fact that if you shake a building that has horse hair plaster to a point of two inches per second, at a certain frequency, you will crack the plaster. What do we care about plaster? Well, plaster is the weakest material, that's the weakest structure that we have studied. We've studied concrete, we've studied rock, we've studied wetlands, we've studied all kinds of things. None of those things seemed to break the veil, or rule, or speed limit until you get to horse hair plaster. So when the Fire Marshal or some regulatory agency says two inches per second, at a certain frequency maybe, they're talking about horse hair plaster. They're not talking about geology, they're not talking about concrete, they're not talking about wet concrete, that sort of thing.

Commissioner Sadik: The cracks, vertical as well as horizontal?

Richard Hosley: That's correct. The world is very site specific but generally speaking during all of the research this is what they determined. USBM is the United States Bureau of Mines, look it up, write it down, you can review it, research it, here's what they say. This is what we need to work with, we need to work with these references and migrate forward through our lives utilizing what research has been done. It speaks for itself. There are some key factors here relative to your question. Right down at the bottom, in rock structures with free faces, if you have a loaf of bread and can slice off slices to a point of relief, or knock dominos off to a point of relief, that's a free face. That helps to direct the explosives energy both in terms of the vibration that is produces and then the direction that the rock migrates. So what we have done with the applicant, using what they presented which are what we call the blasting notes, we've refined this to make this as clear cut in layman's terms to the applicant, to the blasting contractor, who hasn't been picked, to the seismic consultants, to the Town Engineer, the best way to set this speed limit. This is consistent with other studies that go back to 1953. What is the depth of the cut and the distance from the structure that we are protecting? This is very critical when you are blasting adjacent to horse hair plaster, gas mains, water mains, utilities because now what we are talking about, is it in the E zone? If you are twenty feet, I'm

nervous about something twenty feet away. If you are down a hundred feet, I'm worried about something a hundred feet away. If you are down three feet, I'm worried about three feet away. It comes into this veil and that is affected by your point of relief. Keep in mind that explosives are really stupid. All they are is an expansion of gases in a confined area, kind of like stepping on a balloon. When you step on a balloon it pops in the direction that the wall is the thinnest. The bottom line is that point of relief and the way we present that point of relief is going to dictate how the rock breaks and how the adjacent rock, adjacent structures are going to be affected. This is an example of some blasting at the sub base in Groton a couple of weeks ago. It is for a loading dock right up against the building, they are blasting two feet off the building to a depth of four feet, no damage occurred. I have a video of this but I didn't bring it with me, but I could show you. This is a church in Norwich where they blasted right up against the back of the church. This rock actually goes into the basement of the church. You can walk into the basement and stand on this rock. What's interesting about this is that this rock is pretty tenacious and has some horizontal bedding but you'll see it is very different from the rock in the church. This rock is much harder to use as a building stone in terms of cutting it and getting it squared. They found a softer stone, probably in the creek bed from which they could build the church out of.

Chairman Block: Excuse me, the vertical (inaudible) there, that indicates again your bore lines?

Richard Hosley: That's correct.

Chairman Block: In that case, those are inches apart.

Richard Hosley: Thank you. In this case, six to eight inches, and that's all relative to the concern for the structure that you are trying to protect. The great opportunity about this situation and the situation with the applicant is they started blasting at a distance far from the church. They created data, accumulated data, reviewed data and used that data in a conservative fashion to protect this church because there couldn't be a value placed on this church because of its history, because of the Masons that build this, that sort of thing. When they got to this area, and they had what someone mentioned earlier, the municipalities right to make correction, in other words the church's right to make correction, I think that applicant's attorney, any other attorneys here can talk about that, so can the insurance companies, those rights to make correction is what drives us to protect structures such as churches and wetlands.

Commissioner Igelski: What is the horizontal line that we see?

Richard Hosley: Bedding plain, that's a cooling joint, when that rock cools essentially it shrunk, the same way your Mason jar, your wine glass shatters when it's cold and you put it under hot water really quickly. It contracts so quickly if it's extruded onto the surface that it shrinks, which is what the basalt has done, this less so because it is a metamorphic (inaudible) but you have these cooling joints. We refer to that crack as structure, and water might race through that structure and helps to supply our water wells. So that is a critical feature. What's really important about this in terms of blasting is we want to confine the explosive energy in the rock mass and not put explosives energy here because it will be lost in the way of ineffective energy in terms of sound. It will be noisy, it won't break the rock, it will be unproductive, it won't help capitalism because the guy just spent a bunch of money on energy that was wasted, and not only that, it aggravates the neighbors, so it doesn't do anyone any good. This is another example of a different type of rock with horizontal bedding and the, what you see are the half rounds, the vertical lines, yes the vertical lines that you see are where the explosives have burned the rock, pushed the rock away from the existing

rock mass, but have not essentially penetrated it. There is some penetration in these horizontal joints, and although this photo was taken immediately (tape change). This is just a brief summary of what takes place. We put explosives in the ground, they detonate, the first thing that occurs a wave, a seismic wave that migrates away from this. When the blasting consultant for the applicant spoke of peak particle velocity, which was a question that was brought up, or seismic waves, there are a couple of ways to think about that in terms of charge weight. If you were to go to a pool of water and take a basketball size rock and drop it into the water, we would say that the waves coming off of that basketball size rock are very low frequency, high displacement waves. You would see the cork go up and down slowly, but move a great distance. If you were to take a bunch of crushed stone, three-eighths crushed stone in your hand and throw that in the water at the same location once that pool has become still again, you'd see a lot of small, little choppy waves with very little displacement but a very high frequency. That contrast is what we're trying to get the blasting contractor to achieve when we supply him with blasting notes or guidelines. Small charges, high frequency, the use of decking which means instead of one big rock, a bunch of little rocks, hitting that pool of water to change the frequency. These things, these factors will affect how you feel, how you perceive and how the adjacent structures are moved from the explosives energy.

Another thing I want to point out here, the distance from the explosives to your free face is very critical. The closer you move this, the less energy will be put back into the rock mass, but the more energy will move away from the rock mass. So essentially you balance seismic energy with confinement, the ability to keep the explosives in the rock, but not too far away from that free face.

Chris Greenlaw: Mr. Hosley, would you explain that last slide you are looking at the plan view versus the one before it you had the grid, and it was a good analogy that you had from the force of energy, how you can direct it like the loaves of bread. So you might want to expand upon that a little bit more, but the question that I have for you is can you relate the, what we see here as the result of the blasting and the path of least resistance, how it's blowing away from the face, but will that happen with the basalt type rock also if they utilize a certain methodology?

Richard Hosley: Most certainly and my next slide helps to explain that. This essentially represents two charges, one behind the other, almost like two dominos. The first domino might race into your point of relief, the second domino falls in behind that. Depending on the distance between the charge, and certainly the length of the charge, and the geology and the structure, this rock mass will, with the expanding gasses if they are confined in the rock, held in there will cause this flexural slip of the rock away from the solid rock mass, toward the point of relief. If there is too much burden, if those holes are too far back, from your point of relief, these ignorant explosive gasses are going to find their point of relief to the easiest way possible, in this case, it's not forward, but straight up. This would be detrimental to the wetlands because essentially what it would do is it would cause flying debris to land in the wetlands. If it was within a certain distance based on the parameters of this depth and distance and a lot of the engineering calculations that go with this, that we're trying to write into these guidelines. Just a photo for those of you who haven't seen a blast site, these white piles represent where each blast hole is, they are drill cuttings. The cable potholders in front are blasting mats to help contain the rock. The idea of this blast was to have the (inaudible) zone come upward because if it were to go sideways it would end up in the drink, this is the ocean, this was I don't know a week or so ago a job that I was on, and the fact that the retaining wall, the adjacent retaining wall, this retaining wall has no concrete in it, and was within four or five feet of the blast side. This is for a new house foundation on the water itself. I'm just about standing at the high tide mark to take this photo. It would not have taken anything to move this wall and despite the fact that it looks a little funky, it was not disturbed

and that was verified by what is in the blasting notes for the applicant that was presented in a pre-blast survey. They took photos of this prior to the blasting, they took photos afterwards, because of the veil of capitalism the blasting contractor didn't want to spend the money to rebuild this, so he took the time to engineer the blast site so that he wouldn't cause that kind of damage. He was not afraid of the regulatory officials, he was afraid of the attorneys and the insurance company. This is another familiar site that you will see on Route 175 in Newington, and again, this exemplifies the massive nature of the Holyoke basalt which is present here and the limiting factor of the fracture zone in this particular type of rock. Yes there is frost action in the surface, yes you will see callus rock falling off the edge of this from frost action from rain, from decomposition, from weathering, erosion, that sort of thing because this is new rock and exposed new mineral faces, you'll see some mineral weathering over time, some rusting with iron, that sort of thing, but that is all natural. This is a completely different type of geology that scares the heck out of us, when we go look at a job because this could be two hundred feet high, at a ravine in the Rocky Mountains and you know, we're worried about losing a freight line of rail cars or trucks that might be transporting goods and materials and services through this intersection. Clearly this rock which is a shift is less durable, loosely jointed and has extensive fracturing that follows the plane of the slope so the whole design of cutting through here in this direction doesn't work with a pre-existing geology or the pre-existing geologic structure. This is one of my favorites. This was my driveway as a kid, which turned into a town road and blasting actually occurred for this site with that pole in place. It's a six foot cut, this is what we call Branford, or Guilford granite. It's kind of a combination of Bradford granite and Stony Creek granite. Stony Creek granite is important because that's under the Statue of Liberty. None the less blasting was conducted through the hard and soft layers of this rock by carefully confining the explosives in the hard layers, not allowing it to escape out of the soft layers and using a point of relief away from the telephone pole so you could blast without moving or heaving or lifting the telephone pole. How much vibration did this pole hit? Wouldn't surprise me if it was twenty inches per second, but vibration, the particle movement of that rock and that telephone pole isn't going to damage it. Heaving is, or throwing something at it is what is going to damage that telephone pole.

What is the depth of cut and the distance to the structure we are protecting? How deep are we blasting, how far away is the wetlands? Blasting will not be conducted within a hundred feet, we talked about that zone of 150 feet, we've identified some sewer cuts which may have changed and were presented very clearly in the, in Ray's presentation, the engineer's presentation which brings me to our next question.

If blasting is approved, how can it be monitored? How can we verify protection to the wetlands? How can we do this? Well, just by doing what we have done over the last month or years on this application, we are protecting the wetlands. Every time we meet, every time someone stands up with a concern, every time we get a list of questions, we are protecting them. What I presented to the Commissioners was a guideline for the responsibilities of a blasting contractor. I wrote these myself as a Director of the International Society of Explosive Engineers for many years, I'm constantly reviewing how we, as an industry can be perceived in a more ethical fashion. I believe the Commission has this available and basically covers reviewing the qualifications which are in the blasting notes submitted by the applicant, reviewing a pre-blast plan, reviewing the blast plan, implementing a test blast, keep in mind we haven't blasted yet, we're still reviewing, implementing a test blast program, and then reviewing the production blasting program or the concurrent results. We heard a statement that we are going to blast away from the wetlands, I think we want to monitor and review at the same distance from that blast as the closest blast to the wetlands to see what happens. In other words, when they blast, far away from the wetlands, let's take a look at what happens at one hundred feet. Let's monitor it with a seismograph even though we know ground vibration isn't going to do it. It's picking the rock up and dropping it, or throwing rock in the wetlands that is going to do it. Let's monitor this, let's establish what we call a

propagation graph, a list of points, they detonated ten pounds, twenty feet away, this was our seismic reading, put it on the graph. Here's the next blast that was forty-five feet away and it's five hundred pounds, where does it fall on the graph in terms of particle velocity, frequency and that sort of thing. We can gather this data to help guide us through this.

In order for the blaster in charge to accomplish this he must concurrently review. That's my point. During the blasting operations, we have to review. An accomplished blaster does this, he does it for himself, he does it to save money because he's not getting paid to blast over there, or ruin something over there, he's getting paid to do the job at hand. He's got to look at the field conditions, he's got to look at the shock parameters, he's got to design his blast to the point of relief, or the insurance company eats him up.

If blasting is approved how can it be monitored and verified to protect the wetlands? These are the blasting notes for this application. This is probably the most recent copy and you see the red arrow, that's my way of saying, looks good, let's move on to the next one. I pointed out a couple of little changes, because wetlands aren't typically of what a blast protects.

Typically what a blast protects is horse hair plaster, so in respect for the Commission and respect to the focus of this application, I'm throwing in wetlands in a bunch of spots and I will meet with the engineer and make sure that this is put in, and includes this, and identify specifically that the structures that we are trying to protect and that we are monitoring are not only the 1840 house with horse hair plaster, but the wetlands.

I've got to say, because of the interest and the scrutiny of this project, and many projects are like this, the Town of Newington has pioneered an investigation of tremendous detail, and this is an example of it. We don't see this kind of blasting detail on a regular basis. We, because of some of the principles we have discussed, the ethics of the industry or the guidelines of capitalism, we don't have these stringent design guidelines, and this has been included in this application, and it goes on, and on. The green is something we need to remove I think.

Number fourteen bothers me a little bit because we don't want it to look like the owner has too much power, so let's take it out of the owners hands and put that in the consultant's hands or in the review process, or in the blasting consultant's process of evaluation as in number fifteen. You can review these thoroughly and these have been presented and we have gone through this and I would like to thank Ray and their blasting consultant for their patience with this because I really scrutinized this because I think this is going to be grabbed and this is going to be used in Texas, this is going to be used in Massachusetts, this is going to be used elsewhere as our society migrates into concern for the protection of things which is fine if it is done right.

We talked about the blast plans, we have refined guidelines for that, the applicant has stated how they are going to monitor that, all of that fits in with the guidelines of protecting the wetlands and I think it is very important.

So, will blasting for the proposed application fracture the rock outside the construction area causing fissures to open up, drain wetlands, redirect flow? Based on the geologic setting, the structure, the rock strength of the Holyoke basalt, the sample based outcrops that we have looked at in this presentation, the in-depth research by the U.S. Bureau of Mines, Engineering Research Associates, Siskin, Oriard, all of these scientists that are present, are available, and you can research, my experience as a professional where my career is on the line to make these things happen or to protect adjacent structures or sensitive buildings, and based under the principles of explosive engineering I am comfortable deriving a conclusion that blasting for the Newington Walk application as presented can be preformed without compromising the geology underlying the wetland areas adjacent to the site, provided that the blasting notes and data accumulation plan as proposed is followed and refined furthering this process.

If blasting is approved how can it be monitored to verify the protection of the wetlands. The safety of a blasting operation depends on the qualified competent personnel using the proper equipment materials, observing the correct blasting procedures working in accordance with a well formulated plan. This is the seventeenth edition of the blaster's handbook and this

handbook I wrote a chapter on geology and blasting geology. This has been updated to the eighteenth edition, I did not author anything in the eighteenth edition, but it's a phenomenal point of research as you asked.

I hope that answers some of your questions, and I'm looking forward to more. I certainly have a list of questions for the applicant but I think they are trivial questions to make sure that we get that speed limit correctly identified so as this project or some other project migrates in the future, we properly evaluate it.

Commissioner Igelski: You mentioned upheaval to the wetlands would be an issue which you now concluded in your professional opinion is not a problem at this site. The other issue I believe was in respect to particles of material being dispersed into the wetlands?

Richard Hosley: Correct. The way that the industry identifies that is fly rock, in other words, rock actually leaves the blast site, which is illegal in Connecticut, and migrates outside of the blast zone, and that is identified by the blaster, and is regulated by the local Fire Marshal and the State Fire Marshal, and enters the wetlands, or hits a house or hits a car, then you are going to compromise whatever it hits. So, fly rock is the issue. The other thing is heave, not upheaval, but actually using the migration of explosive gasses outside the construction area, lifting the rock and dropping it again. That's what causes damage within various blast zones.

Commissioner Igelski: But will not the fly rock issue be mitigated completely with the use blast mats?

Richard Hosley: They should be.

Commissioner Igelski: Is it the plan to use.....

Richard Hosley: Fly rock is easily inspected, it's easily reviewed, it's very obvious. If you pick something up and drop it, sometimes it's not so obvious. But the parameters, the distance from the blast site to the wetlands, 100 feet, 150 feet, are such that unless they were blasting to a depth of 100 feet or 150 feet, that's not an issue. It would be more of an issue if you had a horizontal structure as I have described in some of my slides. If you had open joints or seams, that ran under your wetlands or your house or whatever you are trying to protect, there's a greater risk of that energy getting in there and lifting it once it is not allowed, once it's confined. If it is not confined, it escapes to the open air, and that is the noise. That's the blast, that's the sound that you here.

Commissioner Paskevich: In this testing that is going to be provided, referring back to the term aquaclude, so during the test monitoring will there be a determination whether there are evidence of aquaclude in these test area?

Richard Hosley: Most certainly, but it doesn't occur after the blasting, it occurs after the excavation, in other words they blast, the rubble the rock, there's a swell factor of 1.5 to 2.7 of the existing rock, in other words, takes the rock, turns it into popcorn, fluff's it up, once that rock is excavated, and you have these rock cuts exposed, then you can identify if there are prominent open structures where gas or water could migrate through them. I don't believe that you are going to find those based on my experience working in the basalt sill that exists in Connecticut at various locations, but I think that should be reviewed by the blast team at a distance away from the wetlands as you migrate towards the wetlands to see if they exist.

Commisioner Paskevich: If an aquaclude did occur, or was in place, or showed up, the water would contain particles other than just water that may move down towards the wetlands?

Richard Hosley: When you say the word aquaclude think of the table. Water cannot enter it when you pour water on it, and I think that's what this geology represents, within a certain range of fragmentation that occurs from weathering and frost, there's a certain layer that the water penetrates, but then essentially it hits hard rock. It, based on my experience, and this is very site specific and it is dependent on a lot of things, but generally speaking, that aquaclude is a hard permeable layer. So what you are asking I think is, as they blasting will we see cracks or open joints? I don't believe we will because it is not the nature of this rock. You may see some vertical joints, but as I showed in the Dunkin Donuts photo, many of those vertical joints are filled with a precipitate of various minerals that have sealed them so that water does not allow penetration of the rock. If that answers your question.

Commissioner Paskevich: Yes, thank you.

Chairman Block: As your most recent review of the blasting plan, it contains criteria for how much is too much as regards to the seismic energy or any other relevant factors, is that correct?

Richard Hosley: It does, it does and very much in depth but it relies on the engineering design of the project which is, you are not going to work within 100 feet or 150 feet of the wetlands, you are not going to blast more than 150 feet deep, you are talking about tens of feet, you are going to utilize the principles of engineering that are cost effective, like a point of relief.....

Chairman Block: So the question is, within those stated parameters, there is, and I'm just going to use X factor as, I don't know what the unit of measurement would be, but it's, I presume you are saying that somewhere in that blasting plan it says within those distances and everything else 10X is the maximum that can be accepted. And when they do the seismic testing they will determine if 8X and therefore okay, or 12X in which case something is wrong.

Richard Hosley: Okay, time out a second. When you say 8X are you referring the vibration?

Chairman Block: I'm referring to any of the sensitive criteria that is involved in blasting. Something that is of concern in our case, to disturbing the rock, the impervious under the wetlands, in your case causing cracking of horse hair plaster, whatever it is, I'm saying, is there a numerical definition as to how much is okay and how much is too much.

Richard Hosley: There are three types of criteria that you want to look at with regard to damage and blasting. One is vibration damage, the migration of seismic blast, the second the heave or the lifting of something and the third is the actual rock movement. I have stated, and research has stated that ground vibration, the energy that is transmitted through the rock from the detonation of the explosives will not damage the adjacent rock mass.

Chairman Block: And this is going to be tested by the use of a seismograph?

Richard Hosley: It's going to be verified and the references that I have cited also have given guidelines.

Chairman Block: Okay. Now you have heard my questions to Mr. Simms as to whether or not it would be beneficial to have more than one site for the seismograph. That two or three or so. Would you agree that that would provide more meaningful data earlier in the blast plan?

Richard Hosley: Most definitely.

Chairman Block: Okay. Thank you.

Richard Hosley: I'd like to talk about that, expand on that. There needs to be a seismograph on the nearest structure. If you want to call that structure the edge of the buffer of the wetlands, or if you want to call it on the commercial structure across the street in Wethersfield, or where ever it may be, there should be a seismograph there. It's a far distance seismograph, kind of monitors what is going on, helps to protect those, that structure  
....

Chairman Block: The seismographs that I care about surround the wetlands.

Richard Hosley: Well, let me finish. There should also be a seismograph a certain distance from the blast in a close-in format. The same kind of close-in format that you would demonstrate if you were blasting adjacent to the wetlands. For example, if you were blasting at a depth of thirty feet deep, 150 feet away from the wetlands, you should have a seismograph set up in an area way far away from the wetlands where you are drilling and blasting thirty feet deep, 150 feet away. So that you can mirror the image or the results and then compare those results as you migrate further. That's that data acquisition graph that I like to refer to so that the applicant, the inspector, the Town Engineer can see well ahead of time that when you are using this charge weight, at this depth a certain distance away, you've got some results, you've got some information.

Chairman Block: Will you and Mr. Simms collaborate on putting forth such a plan?

Richard Hosley: Probably until the day both of us die. Every single day, we are always arguing about it.

Chairman Block: In this case, as it is applicable to this project. Anything further? Thank you. Mr. Logan I believe is up next.

George Logan: I'm going to try to be as brief as possible as there has been a lot of information that the applicant has provided in response to our questions, and I really appreciate that. I understand from what I heard tonight that there are some revisions going on with the plans, so we're going to want to see the revised plans whenever those are ready, as soon as possible, so we can do our final review. I just want to explain some of the things that have happened since the last time we were here. Some of the things that we have been looking at. There have been some memos that have gone out that are part of the record now. Those were forwarded obviously to the applicant and the Commission has also received them. I think there is a total of six memos that we have produced from the beginning, the first one being the questions. At some point if appropriate and depending on questions that we might get I might have Sigrun step up and talk about specific questions on the swamp cottonwood. There was a collaboration between her and Jodi Chase in going out to the site and cataloguing exactly what is going on out there as far as the application. One thing that I would like to say, and please don't take this wrong, Mr. Applicant, I'm not the opposition. I'm a third party reviewer, that is doing my darndest to stay objective, and I hope that my contribution and our contributions here will be to the benefit of all those involved, so please don't see me as the opposition, I'm not that. I am more often than not on the same side as the applicant as a proponent of the project.

Okay, so the last time we were here a couple of things were put forth by the Commission. The Commission said please Jodi Chase and Sigrun Gadwa go out there and figure out exactly what is going on as far as the population. Is it a vibrant population, is it a waning

population, is there a propagation reproduction etc., so that has been done and I'll give you that in just a little while. The other thing that you might recall we, was very important for us to go on with, was to test a little more of the hypotheses that the applicant had put at that time, which is that the, there's a silty clay or a silty loam layer instead of a confining more or less impermeable layer that we found at the edges of the wetland, particularly to the north and to the sides and to the south and also to the west, and the hypotheses was that layer continues throughout the wetland producing more or less of a perch water table for this particular wetland. The first time as you will recall we went out there and didn't have instruments that were deep enough. We were maxed out at about 40, 42 inches. In the middle of this wetland we did not find what I considered to be the same soil formation as what was seen in other locations at the perimeter of this wetland and the northwest and the south, so we decided that we were going to try to come back and go deeper. I remember very distinctly that time that I commented and I think that Dr. Abrams remembers this, that most likely Russ Slayback's company has the kind of equipment that would be appropriate for us to go down and contest and see what is under there, if that confining layer continues across. Just before this happened, maybe a week or so, there was an e-mail and I found that it was a screw auger that was going to be used, the same auger that was used before by Dr. Abrams and he had gotten an extension, I'm sure at no small expense, these things are expensive, and now we would have a total depth of sixty inches. We went out to the site, I forget the exact, I think it was the 27<sup>th</sup>, Thursday. In retrospect I probably shouldn't have been out there, I was in the beginning of my pneumonia episode, which I am recovering from now, that might explain some of the miscommunication that seemed to have taken place between me and Mr. Abrams, and to that I apologize, it was not meant to happen. When I got there Mr. Abrams and company had developed one hole down to about sixty inches. I was running a little late, we looked at that, I asked him to dig an additional hole just to the side and off a little, and they did that, and the water was about fourteen, fifteen, sixteen inches. I did not have the appropriate equipment so I couldn't as far as the legs were concerned compete so they were handing me these soil samples as they were coming out. Here's what happened. What was coming up puzzled me because I wasn't expecting to see what I saw. I saw material that did not conform to a soil strata that was similar to what we were expecting based on what we had seen at the edges of this. I was kind of more or less silent coming to any conclusions, maybe that was construed as agreement, I'm not sure. The same samples that Dr. Abrams showed you, I also have and I have not tested them yet, but what was happening was that as this auger was extracting the soil samples and I did see that there was a mineral component too. I also saw that there was a greasyness, the term greasyness was not something that I put, it was Dr. Abrams who looked at it and said it looked greasy. I responded to that, and I remember that very clearly, it's because of organics. Now Dr. Abrams understanding was that this was organics that was brought up as the auger was coming up through the organic layer which is 28 or so inches that, that was the result of the organics. I wasn't sure at that point. I was a little surprised at what I was seeing, and not being the operator of the auger, I was kind of at a little bit of a disadvantage. That afternoon I found out that one of my good friends in college has the equipment that I otherwise that I would have wanted to use which is bucket augers and core samplers that can go down to ten feet. Even though I was not feeling particularly well, I asked him if he would lend that, the core samplers and bucket augers and he would help me actually, because it is a two man operation, especially imagine trying to get the auger out of a sediment, so the next day we went out there. Typically what I would have done is told everyone what I was doing, unfortunately, maybe because I was getting sick I didn't think about it, I was very curious to see what was going on, I know that Dr. Abrams was not going to be available anyhow, holidays were coming along, the weekend, etc., and I knew that there was a storm coming, so I wanted to get that information as soon as possible. The thing that was peculiar, this is from the memo that I gave all involved, it was December 31, before the year ended. It includes two draft boring logs and an existing conditions plan of the site showing the wetland locations of the bores and some other features. What happened as

the logs show is that as we were coming down through, we went for about 28 inches of organics, and all of this is background to explain where we are going with this. According to the log, at about, let's see, between 34 and 40 inches, we took a distinct undisturbed core, by basically, there is a technique, I'm not going to go into the method of it, but basically we were able to extract a six inch core, long core of undisturbed soil. Now you can do certain tests on that, an undisturbed core, which is important. Then went down to 40 inches, which is, if you remember, that was more or less the depth that we had stopped at with the auger that we had previous to December 27<sup>th</sup>, so if you can imagine, we just took the core and we vacated the sleeve, put another sleeve in to the core and we're ready to go down again to get the next sample. Low and behold with very little strength, we put the auger down, one person, actually it was my colleague and friend, Bill Jackson, between forty and seventy-eight inches. Very low bearing capacity, it was just like going through butter and when we took that core out, obviously we had hit the minerals in the bottom so there was some of that there but the rest was just a sloppy mess of organics and mineral, mineral substrata. Then we continued, we did some other coring, we went down to ninety-seven and a half inches, we got refusal, we were grinding our auger more or less on vertical rock. So that was the end of that. I repeated the same extraction method more or less at the same place that we had gone before where we did see the silt lump and so now we have two things that we can compare. I know there has been a lot of back and forth between the professionals, Mr. Slayback for instance saying that he interprets the data that I have a little different. I'm not exactly sure where we are going to end up. I have of course the applicant has agreed for me to do some certain physical testing at the UConn laboratory which is an approved laboratory, and what I am trying to test is that the mineral deposit that is behind all the organics and above this other what ever it is we are going to discover, is porous enough, has enough permeability that's it's a low density, to allow for outwelling of ground water, during some time of the growing season. I understand that during the end of the growing season that it is not, and maybe it is going the other way around, I have no issue with that at all, I agree with that, that's what happens in a lot of these depressional wetlands. But my fear is, what I'm trying to figure out is whether there is actually, when there is surplus ground water coming in from the watershed, and coming down into the wetlands, that were is actually an upwelling that feeds the wetlands from this reservoir, this bedrock that water slides down and comes under the wetlands, feeds the reservoir and then this upwelling into the wetland during certain times and the season, which is important critical areas and then later in the summer obviously, it reverses. Very, very different from what we saw along the edges. So, the jury is still out, I haven't reached a final conclusion, I'm just trying to test the hypothesis and that's what all that memo of December 31<sup>st</sup> is all about. Moving on, we have a couple of memos from today.....

Chairman Block: If I could just interject, there seems to be a difference of opinion between the two of you, and yet as a layman, I think it's all about two sides of the same coin. When he refers to ground water, I understood it to be some deep permeable source, i.e. a well. When I hear you talking, am I correct in understanding that you mean ground water to be a thin track layer sliding across the top of the basic basalt rock?

George Logan: In localized ground water, (inaudible)

Chairman Block: So the only difference between his position and yours is that you find something of a less permeable intermediate membrane between the surface water and this, what you are calling ground water. So, again, the watershed area that is feeding our wetlands is still limited, is it not, to the ridgeline as the applicant has demonstrated and I don't know what drawing that is at the moment, but it's still a very limited area.

George Logan: Right, and that has changed a little bit with the revision, but yes.

Chairman Block: So what is this testing about?

George Logan: Okay, so here is the testing. I think that probably within, we don't know exactly what the ground shed would be. The ground shed would be the area that contributes ground water towards the wetlands, which I would think we would all agree that there is some contribution from a shallow localized ground water regime to the wetland which is important at certain times during the year. So, if we would hypothesize that the ground shed is more or less coincident with the surface watershed and we looked at what was going on and this is again based on the revised, not on the revised plans, but the original plans. I have provided this little schematic that I think you have, I did my own watershed line which is pretty close to what they did, it's slightly larger, and then what I did, I superimposed on that the proposal as it stands on the old plans. Then I colorized it so I can talk about it. The blue that you see here represents potential ground shed by contributing surface water shed that is going to be taken out of the equation. So under existing conditions within those blue areas, water infiltrates into the soil and potentially comes toward the wetland and expresses itself as a shallow ground water input. The, whatever color, the peachy color that you see up there is an addition of a water shed that does not contribute to the wetland, but under proposed conditions would contribute to the wetland, but it would only contribute surface runoff. It cannot contribute ground water because under existing conditions it doesn't contribute ground water. If you balance those two areas, they are exactly four acres, so the applicant has done a great job in realizing that he is taking some areas that are the surface watershed, it's about four acres, and has replaced it with his grading and his development for approximately four acres in this peach area, so if it is important, this is still the hypothesis that we are testing, if there is significant ground water input within this area that is blue, that contributes to the hydrology of this wetland that's not going to be taken away, and it's now replaced by an equal area that is also going to contribute ground water to the same extent so potentially we've taken about a third of the potential contribution of ground water to this wetland and siphoned it away. Now, this is crude, please understand, this is crude. This is a hypothesis that we are trying to test, so therefore it's important for me to kind of get a handle of what is going on in the wetland itself as far as the ground water component. Whether this is the shallow localized ground water table, not the deep ground water.

Commissioner Paskevich: Question, the blue area, the line that is to the right, is that line showing the development area?

George Logan: Yes, the line that follows along here is what according to their own map is the delineation of the watershed that is remaining to feed the wetland versus the watershed which is being taken away, which is under the blue shade.

Commissioner Paskevich: Also, to the right of the upper blue area there is a vernal pool.

George Logan: Which is right here.

Commissioner Paskevich: Okay, are we going to lose contribution to the vernal pool?

George Logan: This doesn't look at that. This, I would have to generate a different map for that. This only looks at some of the dynamics for the hydrology of the vernal pool of wetland two which has the imbedded vernal pool.

Commissioner Igelski: Mr. Logan, where does the ground water come from that is in that blue area?

George Logan: Well, it's precipitation, and a little bit of surface probably, but most of precipitation that infiltrates into the soils, gets into the rocks, those fractures that are the top of the basalt.....

Commissioner Igelski: That same activity would not be occurring in the new peach colored area?

George Logan: No, because that doesn't currently contribute to this wetland, it goes west.

Commissioner Block: Are you saying that the testing, the additional testing that you are having done now will allow you to demonstrate more conclusively whether or not this is correct or not?

George Logan: Correct.

Commissioner Block: When do you expect that to be finished?

George Logan: We're going to be submitting the data tomorrow to the lab, then based on my understanding from talking to, not myself but some of the other folks, talking to the lab director, within a week.

Attorney Boorman: Did you share this information with the applicant?

George Logan: Yes.

Attorney Boorman: So they know what you are talking about?

George Logan: Yes, this particular memo is December 31<sup>st</sup> and it was sent to everyone on that date.

Chairman Block: Well, we'll look forward to and hearing the conclusion of this investigation.

Attorney Boorman: You should finish your presentation and the applicant should have the opportunity to rebut.

George Logan: Okay. Sigrun will talk very briefly and I will get the information.

Sigrun Gadwa: This is just a brief summary of the investigation that Jodi, who is over there and I did on December 14<sup>th</sup>. We went out and did a complete count of the population and divided it up into the larger trees over five inches, the pole size trees, the small ones and saplings and seedlings and sprouts and made a table with these different categories. It actually.....

Chairman Block: Excuse me, you are speaking to the swamp cottonwoods now?

Sigrun Gadwa: The swamp cottonwoods, yes.

Attorney Boorman: Identify Jodie please?

Sigrun Gadwa: Jodi Chase of Chase Ecological. It's a consultant to the applicant. So, we had more time and were able to do a more thorough job. We divided them, into sections we could count each section in terms thoroughly. There were 100 mature trees and pole size

trees, that was the total which is actually, based on what I have read from the reports, this is the largest and most vigorous population that we have in Southern New England. More than any of the other five populations in Connecticut, larger than the Massachusetts and the Rhode Island ones as well. It was exciting that there were so many saplings and young plants and very little mortality. I do have a column for "dead" on the far right, and what we don't know is to what extent is vegetative reproduction because as we said formerly there's some plants that have grown (inaudible), but the fact of the matter is, it's a pretty dense and continuous population and there are very few other species inter-mixed like pin oaks, and red maples. There are pin oaks and red maples on the periphery and there is some shading going on and some mortality in the first, I think it was....

Commissioner Sadik: So you are saying that these plants are tightly compacted, concentrated? They are not dispersed randomly

Sigrun Gadwa: Yes. Kind of like buttonbush, you all know buttonbush, how that, a wetland will just be full of buttonbush and nothing else, a monoculture and so this is basically a monoculture of cottonwoods and the only place that is stressed is at the far outer edge, like section 3, the saplings, there are four dead ones there, but that was one example. The characteristic of the species is that it's, it seems to thrive where there are clay, silty soils with a lot of calcium and minerals available to it, and it can handle large fluctuations in water levels much larger than pin oak or red maple could handle, so I you know, I don't see any reason why it shouldn't continue indefinitely. It is a particularly fine population, better than, healthier than any of the others. Now there was a question as to whether the viability, the vitality and Jodi had noticed that the shakes of the trees were on the scraggly side, they don't look full and symmetrical especially in the winter time. But if you look up at the twigs, they are full of buds, they are alive, the branches are alive, there is not dead wood, so she and I agreed that they are fully alive, the vast majority of the branches and trees. I wanted to add one thing to George's presentation, he's talking about the shallow ground water contributing to this wetland and it's worth mentioning that shallow ground water, because it passes over bedrock and moves through soil has a lot of dissolved calcium, and minerals in it and that is an important thing for the swamp cottonwood population that you don't get from treated street runoff.

George Logan: Which segways very nicely to the next memo that we produced.

Commissioner Sadik: Can I ask just one quick question? What I was leading up to is the memo from DEEP, Mr. Debaros mentioned harvesting. Is that going to be necessary if they are concentrated?

Sigrun Gadwa: He didn't understand how the distribution of the population, whether it was dense or if other trees were on the outside, but I have to say though, that Hurricane, was it Irene or Sandy, knocked down a lot of pin oaks on the periphery of this location and it didn't knock down any of the swamp cottonwoods. So we had some natural reduction of shade through the storm.

Chairman Block: So you are saying that this is a vigorous stand of trees? Dr. Abrams position was that it is more or less doomed as being unequal to the competition of other plant species over time. What's your, are you.....

Sigrun Gadwa: I see no basis for that. Conditions are ideal for it here.

Chairman Block: And the fact that some of the pin oaks have been removed means that it's likely that the population would increase?

Sigrun Gadwa: Yes, now pin oaks are particularly prone to tip over on clay soil, so that could be another reason that this plant is found throughout this range, not just in Connecticut but throughout the area.

Commissioner Clark: You are talking about the mineral, what is existing right now as far as minerals feeding this stand, in the natural stage of it, can you please compare that to what would be the mineral feeding when, if the development takes place there, and also could you comment on I don't know if you read the DEEP report which suggests that homeowners be prohibited from using herbicides and phosphorous containing, fertilizers. Can you contrast the existence now and the existence.....

Sigrun Gadwa: I would be worried by a reduction in mineral rich ground water and replaced with surface water, surface runoff and I actually noted a very good fact sheet written by someone called Leopold, a botanist in New York state who has investigated calcium rich (inaudible) which are special protected habitats in that state, and he specifically in his list of warnings and management recommendations, avoid diluting the calcium rich ground water that goes into the sand with surface runoff. I'll be attaching that to my report. Your second question was, it's a very good recommendation to avoid using fertilizer and herbicide use, but it is very hard to enforce. I don't think that the, the home owners association might try to enforce it, but if, that's always an issue, whether it can be implemented.

Chairman Block: As you are aware, there is a large area containing another wetland which is off to the west side of Cedar Mountain which the applicant is defining as permanent open space. Has anyone looked in that larger area for this species?

Sigrun Gadwa: Yeah, we walked that entire area, we saw just a couple of common cottonwoods, but it's a completely different hydrology, it's not.....

Chairman Block: So this is still a novel and unique grove of trees.

Sigrun Gadwa: Yes.

Commissioner Paskevich: Let me just expand on that. It's novel to the immediate area that we are looking at, but what about the rest of Cedar Mountain.

Chairman Block: That's what I was asking, is it unique in Southern New England?

Sigrun Gadwa: There are I think just three other basins on trap rock ridges which have a very similar configuration to this one where it also exists. One in Massachusetts and a couple in Connecticut. Three other on similar basins on trap rock.

George Logan: And that really goes to the next thing that we did, when we started seeing the correlation between the geology, the chemistry and the fact that you have cottonwoods at our site and other sites, so we thought it probably isn't a bad idea to get a base line on the available minerals such as calcium, magnesium, potassium, and so what we have done in this memo, which is January 3<sup>rd</sup>, we had rationales for soil testing, and this is for basically getting the base line for the mineralogy of this stand of cottonwoods and surrounding buffer and just the site in general, being able then to compare it with other testing that is not under the same type of geology and/or similar basins that we see as surface runoff. The fear here is this, and maybe Sigrun you want to explain that, what happens when you have this kind of mineralogy and you have surface water that has salts, fertilized salts and etc., what happens.

Sigrun Gadwa: Well, salt in particular causes dispersion of cell particles, it's something, it attached to the exchange sites, so instead of having magnesium, or potassium you have sodium, and you remember Carthage which was destroyed by sowing the fields with salt, it just is not good for fertile soils and the other concerns have more or less to do with it than the heavy metals, it's just not a river that has a lot of through flow water and then the vernal pool discharging so that there is always an exchange, instead there is an accumulation of fine sediment that.....

George Logan: And we are probably going to go a little more into that, but the major concern was for us to do the baseline, figure out the mineralogy of this area, particularly the cottonwood population.....

Attorney Boorman: So, if I could, so what the two of you are saying, and tell me if I'm wrong, is that you are saying that there is a potential for what you just described, but you don't have any data, any resources, any information right now that actually says that that is actually happening. You are just saying that there is a potential, if you find those things.

Sigrun Gadwa: Well, we know what the processes are, we know that if surface water with dissolved salt goes into onto these kinds of soils, they are damaged. That's a fact.

George Logan: So instead of releasing the nutrients of the micro minerals that are necessary they are sequestered, so that the cottonwood population might not be able to handle that.

Chairman Block: Let me also try and make sure that I understand this. What you are saying is that this wetlands area is characterized by a very unique plant population, okay, and you are fearful that the soil chemistry is of a nature that has enabled it to survive and thrive, and that the alterations caused by the proposed project both by volume, and more importantly now, by the chemistry of various runoffs and surface water is going to change the constituency of the hydrology of that wetland and be detrimental to the future health and wellbeing of this plant species, and the plant species in this particular case is indicative of the character of the wetlands.

Sigrun Gadwa: Yes.

Attorney Boorman: Again, going back to what you have right now, as of what you have right now, you have information that you have obtained as of right now, do you have any information that says that you are correct, or is this a potential?

George Logan: We are testing a hypothesis.

Attorney Boorman: So you don't have anything right now, you're testing.

George Logan: We have some backup information from some other studies to look at the gradient technology.

Attorney Boorman: So how long is it going to take you to finish that?

George Logan: Again, it's the week, because it's the same.....

Attorney Boorman: You'll be done in a week.

George Logan: The testing will be done in a week.

Attorney Boorman: And how much additional time will you need to analyze...

George Logan: Probably another week, maximum. We can talk about the timing because we know that there are some constraints, the applicant needs to get our report, with enough time for them to be able to respond, so obviously we are very cognizant that that is an issue, so we will do our best, we have other issues that we are working on in the mean time. The applicant and us will have conversations back and forth on some other things.

Sigrun Gadwa: We can save this, the interpretation of the lab data for the last part.

George Logan: So there is plenty of work for us to do, in analyzing this complex application.

Attorney Boorman: And little time.

George Logan: And little time.

Attorney Boorman: That's my emphasis as little time as we told you at the last hearing, you need to get your work done.

George Logan: Yes. Thankfully we have something to work on that the applicant has provided and we need those revised plans.

Commissioner Sadik: One quick question, you talked a lot about the trees, I never heard any data about nesting, about birds or anything like that. Any comments on that, or is that not...

George Logan: It's another issue that we are looking at, we need to understand, it looks like there is a mantra going on here for the applicant's experts, that this is a non-pristine degraded wetland, and this is far from being the truth, and we will explain how that is, that it is a robust, unique wetland with all kinds of biodiversity. And the biodiversity, that you have a population of threatened swamp cottonwoods, it's evidence....

Sigrun Gadwa: And we do have wetland songbirds that are intolerant of development within three hundred feet, area sensitive.

George Logan: So that was the January 3<sup>rd</sup> memo, I have one more, and I think I'll, unless you folks have questions, as the attorney said, we have a lot of work to do.

Chris Greenlaw: One question, just to expedite data here I want to make sure that we're in turn with the applicant, I just want to connect the dots real quick. We know that the mineralogy is good for the cottonwoods, and that is the calcium, magnesium, and potassium. Now there is currently a watershed that is coincident with the subsoil waters that are going to this area. We want, you were saying that your hypothesis is that these minerals move through the ground water. One of the questions that I want to make sure gets relayed to the applicant and you had a crude drawing, you weren't sure if the ground water was being intercepted, or did not, or was going to be cut off for some reason. Is the applicant, working with you to give you that data so that you can have a pretty post analysis of that quantitative water so that we know what the impact will be.

George Logan: That's the next memo.

Chris Greenlaw: Very good, thank you.

Attorney Regan: I just was going to respond to Chris's question. We have that information and we will be happy to provide it in writing to them.

George Logan: Finally, this is another memo from today and it deals with a couple of things that we thought we should clarify. It has to do with pollutant loading analysis that we requested, and also hydrologic budget of the wetlands, particularly wetland two, that we requested. In our November 28<sup>th</sup> memo, and I'll just read we posed a number of questions, and this is the one that I am referring to here, would the applicant conduct a pollutant loading analysis showing how pollutant loads generated by the development will be attenuated by the proposed storm water management best management practices. Could this be done for sediment, nutrients, metals, BOD and COD. Could the analysis consider pollutant accumulation over time and resulting concentrations in the case of vernal pools two and three which lack outlets. The analysis should take the worst case scenario when the pools hold little water as in mid-summer when pools are likely to have (inaudible) shortly before metamorphosis. The applicant can use any model deemed appropriate including the Scheuler Simple Method but a more robust model such as the Creative (inaudible) Method would be recommended. I think that is clear. What I have gotten to date doesn't come anywhere close to answering that question. On the November 30<sup>th</sup> memo from the applicant or letter from Dru Associates in appendix three there is a storm water pollutant loading calculations using the Scheuler Simple Method however the modeling seems to have been done on the entire property, the 73.7 acres instead of for each catchment area that directs runoff that the various storm water management area, such as for example detention basin number three which is just to the north of wetland number two. Furthermore the applicant did not provide backup information that would allow the reviewer, myself, to verify the inputs, assumptions, and calculations. Furthermore the applicant should estimate the percent removal from each of the parameters modeled in pounds per year, the (inaudible) the last phase of the treatment train for that particular treatment train that they might be looking at. Preferably concentration ranges should be generated for each of the parameters. This would have been part of an output should they had decided to use the Urban (inaudible) model or some similar model. In running the Scheuler Simple Method again we would ask the applicant to use the latest version, version 1.1 of the National Storm Water Quality Data Base for residential, for the residential component, also, for estimating pollutant removal efficiencies by the various Best Management Practices proposed for this particular site the applicant should use the National Pollutant Removal Performance Data Base, the second edition, which is March of 2000, the winter paper, and the University of New Hampshire Storm Water Center Data Base which is their 2012 biannual report which is available on the internet. The later one is the most up to date data base in our region. Finally the applicant should also add some of the more important storm water constituents that were missing from the previous model, which is copper and chromium. This is important because if you look across the plain, the people who are in the know as far as potential impacts to isolated wetlands such as wetland two, that are basically in abeyance, they don't have through flows to much extent. Everything that gets there more or less stays there and it stays there for a long time, and pollutants seem to concentrate over time. Some of them actually accumulate. So what we want to figure out what we want to say to this commission and the applicant, is that the experts out there, myself included never would propose as long as it was possible from us, even polished storm water to enter a wetland such as this. It's not a good idea. There are some very specific things that are happening here that might make it impossible for the applicant to have a project and not be able to do this, so that means that we need a higher level of information that would give some understanding, which might help us to make some recommendations such as mitigation in order for us to get the best possible treatment train and best possible treatment possible so this wetland is not impacted in the future. As I stand here now I believe that there is going to be an impact, so that's why I need the

information, so the applicant can prove to us and to myself that that's not the case. So, that's what I need.

The second thing that we discussed and this is a little more difficult and nebulous, I understand, is from another question that we had and it's this, we asked the applicant to produce a comprehensive hydrologic budget for vernal pool two and three. We want to be sure that there are not significant quantifiable changes to the hydrolics of these areas post development. Again, the reason for that is obvious. We have a population of amphibians they might be a little more plastic in dealing with different types of water but the problem is that the cottonwood population is not so able to withstand changes and I think that was also brought forth by the DEEP letter. So, when I asked for that, what I got is valuable. It is something that was helpful. The engineer revised his report, the project design report, December 4<sup>th</sup>, in an attempt to answer this question, but the problem is what happened there is that what we looked at was a variety of storms and how the wetland would respond to those storms as far as storage and some of the other dynamics. All good information, I think it's valuable to look at, but a budget is something different. So what I have done here, I have produced a very, very simple, it's Carter, Virginia Carter, 1986, she's one of the grandmothers of wetland science in our nation. If anyone knows about wetlands they know Carter et al, well she's in the et al. She's Virginia Carter. She has a very simple, I just used her model, there are other models that are simple, they looked at a budget, and look at precipitation and look at surface water in flow, they look at ground water in flow, they look at evapotranspiration, surface water outflow, ground water outflow, and then the change in storage. So the idea is that what I need to get a good understanding of, what I'm trying to understand here is as reviewers, the ability to look at what is happening during a given year, so we are looking at entire year of data. The (inaudible) model which is the pollutant loading analysis I was recommending which they don't have to use, we can work with the Schueler Method, that's fine, but what they do is they model what is happening in a particular storm water train, by using a data base of storms from a typical year, and I think 1987 was the year that this model used for our area here. So we want to be able to answer some questions. Is infiltration to the ground water changing, and if so, by how much, what is happening with surface water flows, are they increasing, and by how much, versus ground water infiltration during critical times during a given year, such as the early spring, or in the late summer as we mentioned before, what can be expected to be happening in wetland two or wetland three post development. If the goal is to ensure that there is no change in the water budget in these wetlands post development a more robust analysis is necessary that looks at the entire years water budget, not just the big storms. Again, that is quite important, again, I think everyone will agree that it is very important for this particular wetland, wetland two, it's hydrology and it's water quality, it's chemistry. So, Mr. Chairman, that's what I have for you today, there are other things we are working on, if you have specific questions I might attempt an answer, but again our analysis is continuing and we hope to have a final report within a prescribed period of time.

Chairman Block: I appreciate that, but we are concerned because we are running toward the end of our review period and quite frankly between the discovery of the protected species and now your concerns, your hypothesis as to the risks to that population, we need to have this report, your final conclusions both to the water load and the chemistry, and everything else, by our January 17<sup>th</sup> meeting, which I am going to have this particular report added to the agenda so that the applicant has time to respond, you cited some November dates in here, but it seems as if there is a big issue that is coming forth at the eleventh hour. This disturbs me, on both sides. So, again, please you final conclusions, your opinions for the January 17<sup>th</sup> meeting.

Attorney Regan: The 17<sup>th</sup>? I believe you meant a week from tonight, the 15<sup>th</sup>, correct?

Chris Greenlaw: Mr. Chair, our expert indicated that the soils lab results might not be in for a week, so we wanted to give him the week, plus two days, with a fall back date, so if we met on the 17<sup>th</sup>, and he had his conclusions, it would then give the applicant until the 22<sup>nd</sup> for rebuttal.

Attorney Regan: That's correct, and that is my point. I do not want to get his final report on the night that the hearing is closed.

Attorney Boorman: That is exactly what we are trying to avoid.

Attorney Regan: So, that's fine on the 17<sup>th</sup>, that's fine if we can have it on the 17<sup>th</sup>, and have until the 22<sup>nd</sup> to rebut. I just don't want.....

Attorney Boorman: That's exactly what we are looking to set up, so that is why the 17<sup>th</sup> was chosen for that purpose.

Attorney Regan: That's fine, that's fine, as long as we have a period of time. I don't want, as an example, the CERT the last time that came in the last day.

Attorney Boorman: Then we are all agreed on that point.

George Logan: But there is one caveat to that. I'm going to have to work with Mr. Gradwell on the water budget so that we know that what we are doing.

Attorney Regan: Actually our consultants are, whenever you need it, from now to the end of the period as they have been for the last month, so that is not a problem.

George Logan: All right, thank you.

Chairman Block: Thank you Mr. Logan.

I would just like to say to the public, I appreciate your attention during this lengthy meeting and we are here to hear you and we are going to, please, we all have to get up and go to work tomorrow too, so keep it brief and on the point.

Roy Zartarian, 25 Stuart St.: Good evening, I'm going to try to be a lot briefer than I was in previous meetings, first of all Dr. Abrams mentioned the preserve at the Tanger Outlets in Riverhead New York, thirty-two and a half acres. What Dr. Abrams didn't mention was that Dru Associates initially calculated that preserve to be sufficient at twenty-three acres, however conservation interests and the New York Department of Environmental Conservation took issue with that and eventually the initial number was raised by forty percent.

Now tonight what you have gone through has been an example of what I really want to talk about. You are dealing with a lot of information on environmental matters from different sources, from your own consultants, from CERT and from experts retained by the applicant. You now need to evaluate these sources and determine their credibility. If you were to ask me how to do that, what I would say to you is, ask yourself how credible are sources retained by the applicant that completely misstated bird life population on Cedar Mountain. Ask yourself how credible is the source retained by the applicant that planned to plant invasive vegetation in a mitigation basin. Ask yourselves how credible is a source, again retained by the applicant who persists in defining the term fidoremediation. Ask yourselves are credible are the sources who surveys over two years completely missed the presence of endangered trees on Cedar Mountain. Ask yourselves how critical is the source who projected the impact on the amphibian population based on a fallacious use of published scientific research.

Finally ask yourselves why Toll Brothers hasn't responded here publicly to the clean water act violations that members of the public have brought up several times, to the Commission's attention. I would ask that you would remember that Toll Brothers is a known polluter of criminal proportions. Unfortunately they have gotten off the hook with a fine that was easily covered by the sale of one of their luxury homes and a promise to change their ways. Ask yourselves if they have really cleaned up their act. Then ask yourself if a leopard can change its spots, or a skunk its stripes. Thank you.

Gail Budrejko, 21 Isabelle Terrace: As Commissioners your charge is to consider short and long term impacts on wetlands including those outside of the area of development. Included in that mandate is consideration of long term maintenance and productivity of wetlands and consideration of any irreversible damage that can be caused by proposed activities. You all received a copy of the December 2012 CERT report. Authors of this report are considered objective unbiased experts in their field with no agendas. I would like to highlight a few of their observations from the report. Quote, there is potential for indirect impacts caused by construction activities and land development that alters the hydrology and habitat of the site. Construction impacts can be minimized through the design, installation and maintenance of soil erosion and sedimentation controls. End of quote. Well, the word minimize does not eliminate. Construction controls might be able to reduce impact but they won't prevent harm and damage. We have no estimate or quantification of the extent of residual damage that will occur with this development. That's the report, quote, runoff from construction and post construction activities has the potential to pollute wetlands and water courses downstream of storm water discharge locations. During the period of construction the discharge of sediment, particularly during significant storm events could occur even when non-structural and structural erosion and sediment controls are installed. Post construction, the increase in the quantity and peak flow of storm water runoff could contribute to downstream flooding and erosion problems. Additionally, the quality of storm water runoff could be degraded by the presence of pollutants such as suspended solids, nutrients and pesticides from streets and yards. End of Quote. Newington Walk will be an upscale development. Fertilizers and pesticides will keep the lawns green, cars will be regularly washed, driveways and roads will be salted, and unwanted garbage and pet waste will be illegally dumped in the open spaces hidden behind their back yards. This will translate into runoff that will be chronically polluted. Back to the report. Quote, the property contains wetlands that are relatively isolated, headwater wetlands. Headwater wetlands can be very sensitive to changes in land cover that will occur if this proposed development is constructed. The potential for increases in impervious areas and storm water volumes will result in long term changes to the wetlands system, on site and downstream. Intense storm events would likely send polluted water from road and landscaped yards to the basin regardless of protected practices. The long term success of intensive storm water best management practices requires monitoring and maintenance. A plan should be in place to manage all storm facilities and well as guarantees that access to perform periodic maintenance will be maintained and this maintenance will be carried on. End of quote. The big concern still remains, who is going to assume the required long term on-going cost and responsibility for monitoring, maintenance and enforcement of these controls and measures that will only mitigate effects of this development. It's a fallacy and a fairy tale to assume that the home owners association will comply in the long run or that any actions taken by the town against the HOA would not be challenged in court. There is no longer any doubt that the wetlands on Cedar Mountain will be compromised if this development is approved. There is no doubt. This land is not suitable for development. It's going to require, from everything that you have heard, from all of the modifications a significant amount of artificially engineered controls and measures in order to provide minimal protection for the wetlands. If any of these controls that are proposed fail, or are ineffective or if any of the subcontractors fail in their activities, the damage cost is going to be irreversible. The only way to protect that land is to keep it undeveloped. Before I close, I just

want to say, as a concerned citizen, I think it's unfair to accuse the town retained consultant who discovered the existence of these swamp cottonwoods when the applicant's consultants either had no clue or didn't think it was important enough. To be putting pressure and accusing our town retained consultants of having to do a slam dunk, rush investigation just to meet the time frame required by our attorney or the applicant's. Thank you.

Chairman Block: I just would like to make sure that there is no misunderstanding. It's not our time limitations, it's the statutes. It's not that we are putting anybody under the gun, we're all under the gun. We have a limited time in which to receive information, to deliberate, and to rule, so everybody is caught up in what we have discovered, and how we have to interpret now.

John Bachand, 56 Maple Hill Avenue: There is a correction on page four. The first line of text says this is from an aerial, image data base, basin one, two and three can be seen from right to left, it should be from left to right. That image can easily be found on Bing maps. It's kind of hit or miss when you go on those satellite data bases what season you are going to get. They try to do it when there is no foliage on the trees but then sometimes they try to do it when there is foliage on the trees so this one happened to be the perfect, not perfect, but at least good enough to show the points that actually surprised me when I saw it. I didn't realize it was that obvious. I have a lot of things to say, but I'm just going to do it quick and in a bullet format because I tried to articulate in other ways and I couldn't do it. The first thing was from the Toll Consultant who mentioned the dams in the trenches. If I heard him right, he said six inches.

Chairman Block: Would you just refer to where we are in this document?

John Bachand: No, I'm off the document, I just had that one correction. You can read that when you have a chance. These are some quick things that I am going to go over. The dam, the trench dam, it has to do with preventing water from flowing through the trenches away from where ever they want it to go and go where they want it to. A six inch trench, a six inch wide dam, if I did hear that correctly, in a twenty foot high trench made out of clay or silt I believe, with, that is supposed to be the impervious dam, the trench filled on both sides with impervious fill, that doesn't make any sense, it won't hold up. If you are going to do it, it's a good idea, do it with concrete. That's the only thing that will hold up, or if you are going to do it with a natural material like a clay, you would have to make it three or four feet wide for a column that high. The detention outfalls, even though they moved them closer to a lower grade, they are still going to be streaming into the wetland in a single stream fashion. They are not going to spread out, they're going to be flowing into the stream and I believe that is going to cause erosion. I talk about that in the letter there. I hate to bring this up because it has been brought up already. The Army Corps of Engineers, I thought that was settled before and now Toll is saying that it's settled again. This newest letter, from what I heard doesn't confirm anything about that there is not jurisdiction there. All it is saying is that they don't need a permit, we knew that from the very beginning, that is not new information at all. It actually confirms jurisdiction, it's telling them that they don't need a permit because they are not doing the work there, but if they were to fill, and that means accidentally or unintentionally then there could be an Army Corps action or an enforcement or a, some type of action. I'm going to say, that answers the question. I don't get that. We've had letters back and forth, and I know that that has been hashed over so many times, but to come from the, it just seems like they are misrepresenting the issue.

The next thing, I'll just touch real quick on it, the blasting effect. I don't know much about blasting, but I just had the one question that I brought up last time and that is the effect on that rock that overhangs the wetlands. I heard the blasting expert refer to it as free face, it's kind of like a natural free face there. This sketch is just rough, but some of the blasting is

going to be in this area here, where the closest foundation is going to be and I'm concerned about what will happen with that rock. If it did fall, it's going to fall right into the wetlands, so that would be your inadvertent filling. The blasting consultant for Toll stated that he was more concerned with the homes on Russell Road than the wetland. That concerns me and I hope he changes his position on that. I mean it does make sense from the builders point of view, he doesn't want to pay for damaged sheet rock or plaster or foundations, and long term damage to a wetland is basically free, so I understand that, but I hope he will change his position on that. Mr. Slayback doesn't believe that there is upwelling of water into the wetland. From my very first letter and from the very first time I spoke here I said how we tried to stick with the physical features of water, that is my specialty, I'm been in the water and drainage business for thirty years, so I give credit to the REMA people for you know, being brave enough to come up with that theory. I actually raised that question in my very first letter about the effects and interference with all that trenching, what it is going to do to the ground water flowing into the wetlands. Mr. Slayback also mentioned something about, the water can't break the law of gravity, or flow up hill, but actually, there is, and you did bring it up, the artesian well effect that is when water appears to break the law of gravity because water could come up out of the ground in a column, higher than the surface of the ground. There's actually one, I don't know if any of you are aware of this, right at the end of the street, right next to the Eddy Farm Stand. There is a concrete column of pipe that comes out of the ground, and the head of pressure from up at Indian Hill, or up on the golf course actually pushes water in an artesian fashion where it comes up out of the ground higher than the surface of the, it's in a little stream there. Water comes up out of the ground there. The old timers used to get their drinking water from there, it's fresh water and even though the surface water wasn't that fresh because it was coming out of a farm field, that water was clean because it was coming from the aquifer up out of the ground. So, Mr. Abrams stated that the stream doesn't dry out, I'd like to know where, I mean, that it does dry out. I would like to know where he gets that information, I know he doesn't even live in the state. There is me, as well as a few other people I know that have first hand knowledge of that area, that will tell you that only under the most extreme conditions that basin one, or wetland one which is basically a stream will ever dry out. I do believe that there is a strong ground water influence or element going on, on this mountain. He also talked about the wetlands not being pristine, and he actually showed you an interesting Google Earth, they have a comparison thing where you can go on line and put the two sites right next to each other. I love that stuff, so I'm interested in that. The picture he showed you did not show you any of the area that is watershed or even ground shed except for the farthest edges of the ground shed, you know, the water is going into the wetlands from far away, which he believes it isn't, that cleared area and that farmed area was outside of the watershed going into the wetlands one and two. Maybe three was within that cleared area, but as far as I can tell, from the topography and everything that I can see there, those wetlands have never been influenced by any type of development what so ever. Only the dog walking and the motorcycles and the camp fires, and this is going back forever, so there is absolutely no evidence that there has ever been any influence on that, and that's probably why this unique stand of trees is, has survived there, probably had something to do with it. If you look again at those old aerial maps you can see that you're looking down, you're not looking at a sectional view of it, you are only looking down from the top, so it's hard to tell, but it's way outside of the area. The area around the wetland one and two have never been farmed, they are too steep, the terrain is too rough, there has never been any activity. The trees were probably cut down, that's true, they clear cut the entire area at one time, but there was never farming there as far as I could tell. And now they brought up the Town, some new formula or some new inclusion in the deeds that the Town will be able to go in and clean those detention basins, or maintain the storm water management system, I'm just curious, if there is a way to lien those property owners for that work. If that will be in the deed as well. That's really going to put their feet to the fire. It's one thing to just say, oh, we have permission to go in there, we have a right to go

in there, but why should we have to assume that cost. Why not, if you are going to write it into the deed, make sure they know there will be a lien for it. So, just to talk free hand for a second more, about the, I know that everyone wants to go, so I'll make it real quick, but about Mr. Logan's idea of the ground water influence into here, I strongly believe in this, I've been thinking this right from the beginning from my first letter, because I looked at it, why is it so dry this year. I think when snow falls in this area here, we had no snow last year as everyone knows, that snows sits and slowly perks into the ground. Now don't forget, here is the line, this is not to scale of course, but it's kind of roughly close, anything, if you understand hydraulics and ground water, anything from above this whatever, this bottom of the floor of the wetland could influence this wetland. So if you drew a line right across here, even though it is outside of the surface runoff watershed into the wetland it could easily be taking water into the ground and feeding it into the wetland this way. Now, one thing that totally supports what he says about, and what I totally believe that there is ground water influence, this brook right here, or this stream, basin one you are calling it, it's very rarely dry. Only in the most extreme, extreme drought, a month of drought and no rain. So that tells me, you can see how steep this terrain is, the runoff from the latest rain event is going to run off very quickly. It's going to drain off in a day or two, but for a month later for this thing to still be flowing, and this is the top of it too, if you looked at this from the top, wetland one just about begins in this area here, just a little bit further south from basin two here, that just tells you, it's almost absolute proof that there is ground water influence that is feeding that stream all the time. Middle of August after no rain, and you still have water moving in there. This year is the only time I have seen it a little bit dry, but if you poked around and dug under the rocks you could actually find water. It actually dries up near the bottom which is kind of an anomaly, but that just tells you there is more fill down at the bottom of the hill, so where it crosses under Mountain Road there, you know, it actually dries up, but for a large section of it, that's why it is so visible from those photographs. That's all basically that I wanted to say, that ground water influence is what you are trying to come to, it's going to be very difficult to prove, but I believe that typically this wetland from my experience is much fuller than it is this year, and when there is a substantial amount of snow melt, that there is a slow percolation into the ground and a slow feeding or delivery.

Allison Clark, 25 Wilbur Drive: Toll Brothers said no activities were proposed in the wetlands, water course or regulated area. The CERT page 13 states although there is no direct impact to those areas, there is the potential for indirect impact caused by construction activities and land development that alters the land hydrology and habitats of the site. On page 31 the CERT states with adjacent development to the east, it seems reasonable to believe that basin two will lose functionality as an amphibian habitat over time. At the last meeting Dr. Abrams said he has done his homework and he understands the character of the swamp cottonwoods. The wetland hydrology needs to be maintained in a condition to which the plants have adapted and it is necessary to protect the wetlands for the aquatic breeding, fauna, frogs and salamanders. It's thoroughly compatible with their intent to control the drainage and return the drainage both to the natural pattern and natural volume and if we don't alter the character we will be in a position to maintain the water volumes as they have been....which in effect will protect the swamp cottonwoods. I know that sounded a little bit (inaudible) but I didn't understand it myself. Oops, did he forget to mention that he had been on the site for two years and he missed it, or oops, he forgot to mention it. Did you also notice that in the intent to control the hydrology drainage and if we don't alter the character statement, shouldn't he have said, not because we will control the drainage and because we won't alter the character...we will protect the swamp cottonwood. Again, very disjointed, I think it should have been more affirmative instead of, if we do this, it may do that, sounded just like a blasting expert paper that I read that said blasting may not affect the wetlands, it should not affect it and because it will be controlled blasting it should result in, blah, blah, blah. The Town's independent expert Richard Hosley gave the applicant a list of questions at

the last meeting too. Chairman Block asked him to go through the list of questions. The first couple had to do with the construction sequence and the time frame for the project, the second was the time frame of the blasting sequence. To both questions it was stated that the applicant's engineer at that point had not resolved the question. They were working on it, I guess this is evolving, but again he reiterates moreover that this question requires further clarification. This was repeated several times. Excuse me, but they have been here for two years and if they didn't bring in a blasting plan, with questions answered by now, it just amazes me. If it were me, I think before I even walked in the door I would have had a blasting plan ready, I would have had answers ready, I know that the plan gets tweaked and you move a couple of little lots around, but they should have had their answers ready by now. So here we are at the eleventh hour as of December 4<sup>th</sup>, the last meeting they still didn't have a blasting plan, they had what was called a starting point. How can you approve this application when, they did not report the presence of the swamp cottonwoods to us or to the DEEP, was it neglect, or was it oversight? Which is worse? Can we trust that Dru Associates who, according to Dr. Elizabeth Harper did not understand the data or intentionally manipulated the data to mislead us, and the Commission? Again, what is worse, a lack of understanding or the intentional manipulation and/or misleading? Does their recent citing and fine by the EPA give you any reason to doubt their credibility? Have they presented by-laws to the home owners association, maintenance or management plans that clearly identify how the HOA will maintain things like the tunnel, mitigation areas, the filters, hydro dynamic separators, road drainage, all those issues, not just the issues raised by the Town of Wethersfield. Is there one hundred foot buffer, now I guess the 150 foot buffer, adequate to protect basin two and the swamp cottonwoods? Will the surface water, post construction impact the hydrology of basin two? If this Commission must approve this application, please at least consider the CERT. I think originally they stated that Lot 31 through 48 should be removed. That was everything that was basically north of the amphibian tunnel. I guess at this point the numbers have changed but it is interesting to note that is now Phase Three. Still they took all, I notice those few lots that they did take out to the west of the basin, they put them to the north, which is the whole area that the CERT said they should have taken away. Instead of putting fewer houses up there, we put some more. I just had to note that, I found that funny. Incidentally, I have heard it suggested to the applicant and experts that they should agree on certain findings, such as the age of the swamp cottonwoods. It is nice that they were able to do that, but I don't think they have to agree on anything. It's up to you, the Commissioners to listen to the information, decide for yourself what is the most believable, and reasonable. What does the evidence reveal? If the applicant hasn't proven their case beyond a reasonable doubt, by now, well, shame on them, and you should deny the application. This is the last parcel, the highest conservation parcel in this town, it's a priority according to the 2020 Plan. After all of the questionable testimony that we have heard, it seems to me that if you approve this development we might as well throw away the 2020 Plan into the trash, because it won't be worth the paper that it is written on.

Holly Harlow 11 Edmund St: Good evening. I'm sitting in the back, I can't see the clock.

Chairman Block: You were lucky.

Holly Harlow: I think when we are talking about protecting the environment for the survival of the swamp cottonwoods, and protecting the integrity of the structure of the wetlands we can probably all agree that mistakes are not an option. Like Allison just commented about statements made about blasting, if everything goes the way that it should, then it should have the desired results, and I think that Mr. Hosley pretty much said that too, that's a prudent thing to say, as long as you follow the rules and do everything right, then it comes out the way that you want. I wouldn't be afraid of lawyers or insurance companies if something goes

wrong in the blasting and something does happen to the wetlands because they'll be gone, money doesn't matter when it comes to that. I vote for keeping the water right for the cottonwoods, you make a mistake, they're gone. Where is the recourse for that? Another point, as far as the blasting goes, I would love to know seriously if a contractor without the right skill and something did go wrong, how bad can bad get? I would really ask this series of question, how can this go wrong, what would happen if the wrong techniques, the wrong blasting, the wrong whatever, the rules weren't followed right and something did go wrong. I would like to know what could go wrong and what it would look like. And finally on another note, a couple of months ago I spoke to some folks down in Riverhead New York who in the '90's unsuccessfully tried to preserve a unique and rare habitat called the Grandifoley (?) and Sand Hills. The environmental consultant for the developer in that case was Ron Abrams of Dru Associates. The folks I talked to warned me that he is a very educated man, he's very smart and something will happen like I saw tonight, and that was addressing me the public and the Commission in a condescending snarky, bully, kind of way, they told me that's what would happen. And the manipulation of the data to make it sound like it's plausible and feasible but I just ask the Commission to use all the resources that you have, Dr. Harper's information that was handed to you, the information from the REMA people, from the CERT report, parse out what Dr. Abrams had said, parse out the information that you have from all of your resources, determine for yourself what is credible, what sounds right to you, what sounds correct, because the mountain depends on it, the wetlands depend on you to do that and I know that you take it very seriously. Thanks.

Mary Peletier, Hartford: Hello, I actually live in Hartford and I'm the director of Park Watershed which is an emerging watershed stewardship organization. We were formed in 2005 as part of the Farmington River Watershed Association, and we're now, as of this year becoming our own independent group. We cover the 77 square mile watershed that stretches east from the Metacomet Ridge towards the Connecticut River and the Park Watershed is, there are two major basins, the north branch of the Park River which is Bloomfield and Northern neighborhoods of West Hartford and the south brand watershed which includes Bass Brook, Piper Brook, Trout Brook and their neighborhoods and so I am here to share my observations. I've been following this in the newspapers but I haven't really been reading the stacks of information that everybody has gone to, but the big picture, this is really about the land loss in an urban/suburban watershed, and what does that mean in the long haul? You know, as an urban/suburban watershed stewardship association we are not against development, we have to be for development because urban/suburban places are about development, however so much land has been lost in this watershed and throughout the greater Hartford metro area that balancing development with redevelopment is one of the challenges, so that these incredibly unique places like Cedar Mountain or the Metacomet Ridge or, there's lots of places, are very essential to the fabric of your community and in trying to figure out how to say something meaningful about the big picture, about the long haul, I thought of some gentleman that I met at a retirement community and he couldn't speak very well, but his wife had come to our presentation and she pointed out that he had helped save the Metacomet Ridge from having a highway going across it. I don't know about you all, but just imagine if they really had built a highway on the Metacomet Ridge. Imagine for a moment if a group of people had stepped up and said, don't bury the Park River. Don't put it in a conduit. So much, I spend so much of my time talking about the buried Park River which of course goes underground at Farmington Avenue and over in Pope Park and then travels underground for a couple of miles and then flows into the Connecticut River even though there is a 77 square mile watershed and a number of tributaries, including Piper Brook, all people remember are the degraded parts of the watershed and I constantly have to go out to that and say there are beautiful places all over this community that aren't lost. But when places like Cedar Mountain are put up for sale, it's hard not to understand why people are moving to the Farmington Valley, people are moving to the shore, people are moving to

Vermont because those are places where conservation has become a priority to the fabric of those communities. One thing I can say for certain is that water quality absolutely declines in the ratio developed land. I worked with the engineers on a two year study on the north branch Park River watershed management plan. That is the focus of my work, is primarily the north branch because DEP themselves is concerned with the water quality problems in the south branch are so complex they couldn't take it on, so that they sort of oriented me around the north branch, but again, the watershed association really has to look at the whole watershed and the lessons that we learned from the north branch, we can see how they can, how they mean something in the south branch, and one thing is for certain. As homeowners routinely dump stuff at the back of their property and I see it all the time, so the woman who had the dark blue on, everything she said was like, exactly what we see throughout the watershed. So you have a really difficult task, but I ask you just think about that, what if there was a highway on the Metacomet Ridge? Who made that decision? Who made the decision to bury the Park River? What decisions would be made today. The urban/suburban watersheds are death by a thousand cuts, that's what has happened and what we need to do is to turn the tide and start asking developers to look at abandoned properties or properties that aren't well used and to redevelop those, and I know that is not the responsibility of this Commission, but the responsibility of this Commission is to protect the wetlands and the landscapes and ask other to go and develop somewhere else. Thank you for listening and I have to say, I just think this is an amazing group of people who have done such a great job.

Myra Cohen, 42 Jeffrey Lane: Member of the Town Council but I'm speaking for only myself, and I apologize I missed quite a bit of the evidence, unfortunately our town council meets the same time, so I may be repetitious, but I do want to point out that I get the feeling that the applicant has presented what they have to present until they are asked. For example, we were given the depth of blasting, for the basements. I don't know if you ever got the depth of blasting for utilities which would be a different number, that had to be requested. As far as responsibilities whether it's a Home owners Association, or the individual home owner, who is going to monitor what they do on their own property, whether it is carelessness or ignorance, the damage that will be done, and when the town discovers it, it will be too late, damage that cannot be reversed, so no matter what the penalty is it's not going to help. Who on the town staff or whatever, who is going to monitor and watch how they are maintaining, the maintenance being done by the homeowners, and the care that they are giving to the property that really may be theirs, but is essence is really everybody's property. As far as the tunnels for the animals, who is going to maintain that, and we've been told, oh yeah, the animals are going to find the entrance to these tunnels and I think we have heard from the other side that sometimes the animals can't find the vernal pools or something like that, so I don't know that we have evidence that that tunnel will work necessarily and that they will be properly maintained. The, to lose that mountain, or that section of the mountain would be a disaster for the town. You've got, what we are learning that what Mother Nature has given to us in the way of a system where the vegetation there attracts the birds, one is dependent on the other, if you damage one, you will damage everything, but please keep in mind, the town government can't take on anything else, please don't throw us any more headaches, and I do want to take this opportunity to thank the public for being so diligent and so wonderful and also, this Commission, you volunteered to get into this, I don't know that you knew what you were getting into, but the public has been so diligent and so wonderful and working so hard you should understand that the reason they are doing this, they get nothing out of this except from their heart, what they love in Newington and what they love in Connecticut and love what Mother Nature has given us, please, help us keep it there. Thank you.

Chairman Block: What they get out of it is our town. It is twenty minutes of midnight, I thank you all.

Commissioner Sadik moved to adjourn the meeting. The motion was seconded by Commissioner Clark. The meeting was adjourned at 11:40 p.m.

Respectfully submitted,

Norine Addis,  
Temporary Recording Secretary

